

LANDS NORTH OF THE WILD ROGUE:

**AN HISTORICAL OVERVIEW OF PEOPLE AND
EVENTS NORTH OF THE WILD ROGUE RIVER**

Native-X Archaeological Services



February 2001

LANDS NORTH OF THE WILD ROGUE:

**AN HISTORICAL OVERVIEW OF PEOPLE AND
EVENTS NORTH OF THE WILD ROGUE RIVER**

Prepared by

Elizabeth E. Budy (Ph.D.)
and Submitted to

John W. Jones (M.A.)
Native-X Archaeological Services
Klamath Falls, OR

Prepared for

Bureau of Land Management
Medford District, Medford, Oregon

Contract Number HAP002005

February 2, 2001

TABLE OF CONTENTS

List of Figures	i
Acknowledgements	iii
Introduction	1
Historic Overview	1
Early Exploration and Immigration	5
The Discovery of Gold and Its Aftermath	7
Early Settlement	7
Conflict and Contact	9
Rogue River Indian Wars, 1855-1856	11
Placer Mining on the Rogue River	18
Early Placer Mining along the Wild Rogue River, 1850s-1880s	20
Chinese Miners	26
Hydraulic Mining in the Early 1900s	27
Depression Era Placer Mining, 1929-1942	29
Gold Lode Mining	31
Mt. Reuben Mining District	33
Lode Mining Technology	41
Settlement Along the Rogue	45
Homesteading	45
Miners' Cabins	48
Transportation and Communication	49
Early Trails	49
Roads	53
Depression Era Employment Relief	55
Civilian Conservation Corps	56
Federal Management	62
Oregon and California Railroad Revested Lands	62
Siskiyou National Forest	64
Bureau of Land Management	65
Place Names	66
References Cited	80

LIST OF FIGURES

Figure 1. Project Vicinity Map: Kelsey / Whiskey Cultural Resource Survey. Based on USDI Bureau of Land Management Medford District Map.

Figure 2. Project Vicinity Map (stylized): Kelsey / Whiskey Cultural Resource Survey.

Figure 3. The rugged landscape of the wild Rogue River in the vicinity of the Kelsey / Whiskey Project Area; based on the Rogue River Gazetteer Map in Loy et al. (1976: 190).

Figure 4. The Siskiyou Trail, explored by the Hudson's Bay Company beginning in the 1820s and established as the Oregon-California Immigrant Trail in the 1840s; based a map by Charles L. Camp in Dillon (1975: n.p.).

Figure 5. 1853 Military Wagon Road; based on one copied from the U.S. Military Map and annotated by W.J. Street (from Hill 1976: xiii).

Figure 6. Volunteers on the march in Rogue Country (Glisan 1874; from Beckham 1971: 111).

Figure 7. Military Forts and Camps 1851-1880. Compiled by Works Projects Administration in the 1930s, but never completed; from Preston (1970: n.p.).

Figure 8. Indian camps, battle sites, and militia fortifications located in the Kelsey / Whiskey project area during the Rogue River Indian Wars 1855-1856.

Figure 9. Generalized geologic map of the Kelsey / Whiskey project vicinity; from Brooks and Ramp (1968: 170).

Figure 10. Miner working claim with simple technology, pouring water into a rocker cradle and with pan, pick and shovel close at hand; from Southern Oregon Historical Society Photo Collection.

Figure 11. Basic gold recovery equipment developed during the early placer mining era: rocker box, long tom, and sluice box; from LaLande (1985: 32).

Figure 12. Schematic illustration of "giant" nozzle or monitor, showing deflector tip, deflector lever, wooden counterweight platform, and pipe from penstock; from LaLande (1985: 34).

Figure 13. Monitor at work; from Evans (1883: 5).

Figure 14. Solitary miners resorted to the primitive technology of the early years during the Depression Era; unidentified miner from the Southern Oregon Historical Society Photo Collection.

LIST OF FIGURES
(continued)

Figure 15. The Alameda Mine about 1910, from *Grants Pass Courier* in Brooks and Ramp (1968: 203).

Figure 16. The Greenback Mine, from Hill (1976: 38).

Figure 17. Major gold lode mines in the Mt. Reuben District.

Figure 18. Map of the workings at the Benton Mine, from Brooks and Ramp (1968: 205).

Figure 19. Map of the Mt. Reuben District showing principal mines and claims; from Youngberg (1947: 4).

Figure 20. Two views of an arrastra, from Sagstetter (1998: 72).

Figure 21. Two views of a small stamp mill, from Sagstetter (1998: 59, 68).

Figure 22. Typical amalgamation/concentration mill, from Sagstetter (1998: 56).

Figure 23. Historic trails in the Kelsey / Whiskey project area.

Figure 24. Unidentified miner with his mule "Willy;" from the Southern Oregon Historical Society Photo Collection.

Figure 25. Mules trains, like the one above, were used to haul equipment from Glendale over the Mt. Reuben Wagon Road to the Gold Bug Mine, from Sagstetter (1998: 82).

Figure 26. Civilian Conservation Corps Camps, from Medford District Civilian Conservation Corps (1938: 9).

Figure 27. Example of road building equipment ca 1930s. Courtesy Medford District BLM.

Figure 28. George Morey at work on the Mt. Reuben Road in 1933 or 1934; from George Morey Collection, courtesy Medford District BLM.

Figure 29. Checkerboard pattern of the O & C lands in the Kelsey / Whiskey project vicinity; from (BLM 1961: n.p.).

ACKNOWLEDGEMENTS

As the contractor for this project, I would like to thank Elizabeth Budy for all the hard work and effort she put into this historic overview which was an invaluable part of the overall project. Without her diligence and support this contract would have most likely been given to someone else. I would also like to thank all those who contributed valuable information (sometimes with great enthusiasm), data, and support during the course of this project. Special thanks goes to Medford District Bureau of Land Management personnel, Dave Reed, Ann Ramage, and Matt Craddock, as well as Glendale Resource Area personnel, Diane Perry and Loren Wittenberg. Thanks also to Kay Atwood who provided good will and guidance to the historical collections. I also think it necessary to thank the local landowners who happily shared their wealth of knowledge with the field crew during the fieldwork portion of this contract. Finally, I would like to thank the two scary miners that were encountered out in the middle of nowhere; they kept things interesting.

John W. Jones
Native-X Archaeological Services

INTRODUCTION

The Medford District Bureau of Land Management (BLM) contracted with Native-X Archaeological Services of Klamath Falls, Oregon, in the Spring of 2000 to conduct a cultural resource survey and extensive historic overview of the Wild Rogue Watershed (Jones 2001). Although the watershed includes lands both north and south of the Wild and Scenic section of the Rogue River, this project only included lands north of the river and extending approximately 16 rugged miles from the Rogue River Ranch east to the Grave Creek Bridge (Figures 1 and 2). The project area does not fall within the Wild and Scenic corridor immediately adjacent to the river, but instead begins at its boundary, generally 1/4 mile from the river's edge. In order to lend perspective and life to the historic events that occurred within the vicinity, the following historic overview draws from regional as well as local sources.

HISTORIC OVERVIEW

(by Elizabeth E. Budy)

The lands located within the Kelsey / Whiskey Project area compose a rugged landscape that rises steeply along the north side of the wild section of the Rogue River (Figure 3). Cut by numerous deeply incised creeks, and isolated by steep terrain and narrow river canyon, the history of the area is tied to its remoteness, difficulty of access, and relative isolation from major mining developments and settlements established elsewhere along the Rogue River and its tributaries. Gold was discovered in tributaries of the Rogue River in 1851, and the rush to the gold fields resulted in the eventual settlement of southwestern Oregon. The lands of the Kelsey / Whiskey Project area, however, were too rugged for early settlers. Unsuitable for agriculture, and lacking transportation systems, the steep lands never developed significant towns or commercial centers. The very qualities of remoteness and inaccessibility made it a place of retreat for native peoples during the conflicts of 1855-1856, the so-called Rogue River Indian Wars.

Gold was discovered in the placer gravels along the wild section of the Rogue River in the 1850s, but the gold rush to this area appears to date from 1856, subsequent to the militia campaigns against the Rogue River Indians hiding in this area in the winter of 1855-1856. Although rich gold deposits were found on gravel bars along the river, as well as along Whiskey and Mule Creeks, these were soon exhausted. By 1860, the area was left to a few hardy miners, and among them, the Chinese who reworked the abandoned claims. In the late 1880s and early 1890s, rich lode pockets were discovered on the slopes along Whiskey and Mule Creeks. Several mines, such as the Gold Bug and Benton, were major producers in the early 1900s. The Depression Era awakened renewed interest in the mines. Thousands of men camped along the Rogue and made a small living by reworking the placers. Lode mines were re-opened, and with a raise in the price of gold, expanded production. Gold deposits in the mines of the project area were limited to small veins or pockets. Although very rich, these

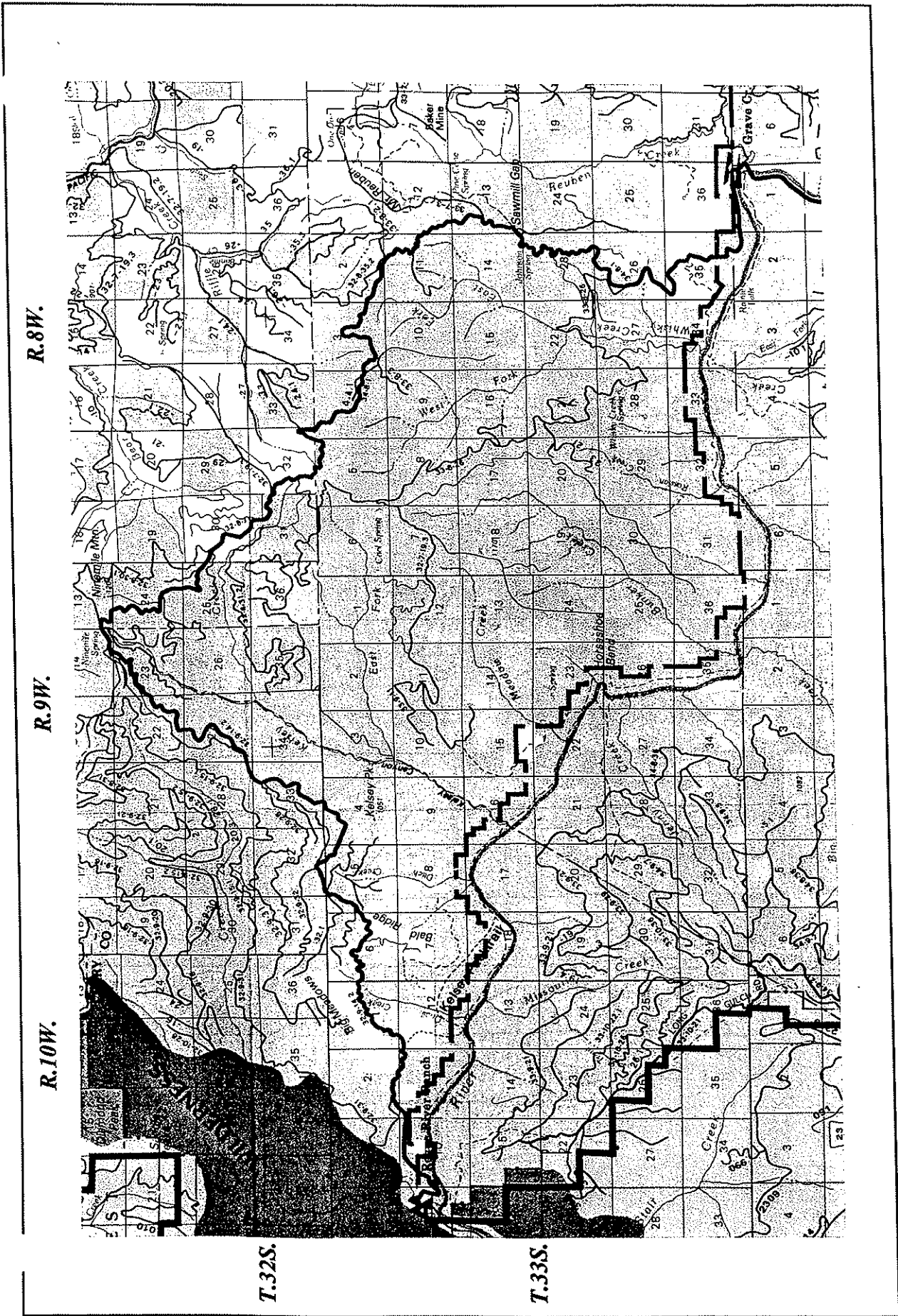


Figure 1. Vicinity Map: Kelsey / Whiskey Cultural Resource Survey. Based on U.S.D.I Bureau of Land Management, Medford District map. Scale 1/2" = 1 mile.

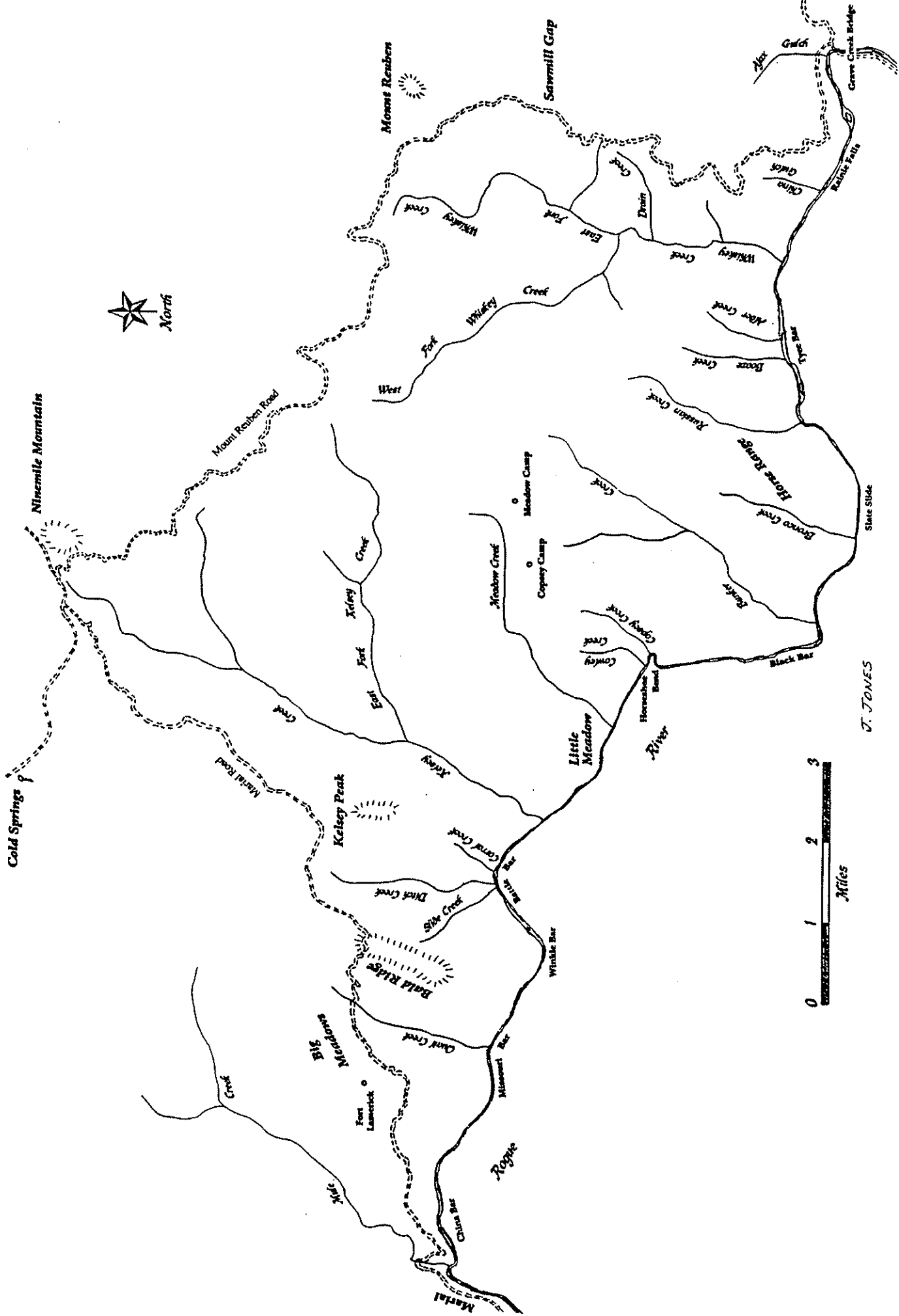


Figure 2. Project Vicinity Map (stylized): Kelsey / Whiskey Cultural Resource Survey.

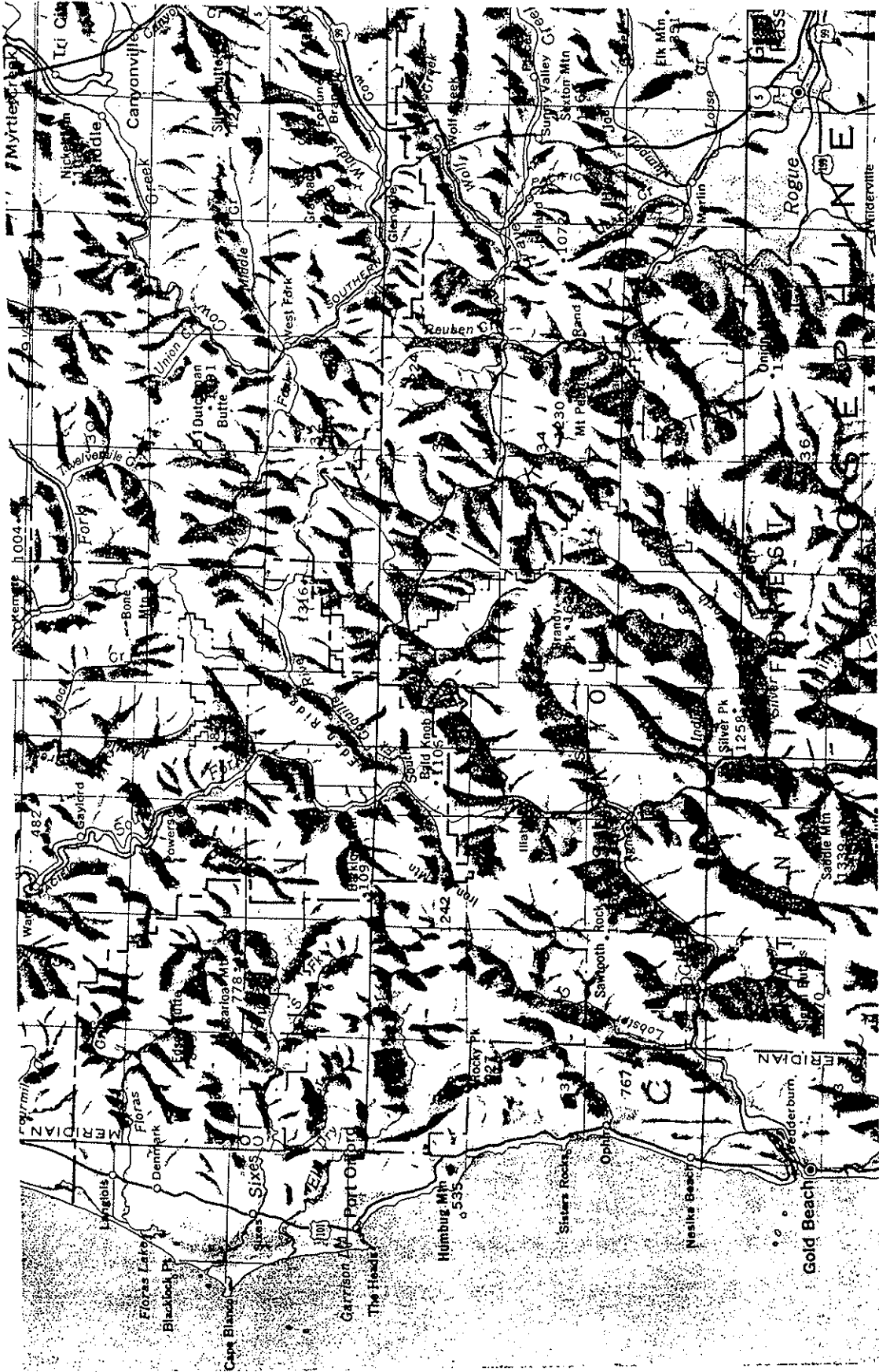


Figure 3. The rugged landscape of the wild Rogue River in the vicinity of the Kelsey / Whiskey Project Area; based on the Rogue River Gazetteer Map in Loy et al. (1976: 190).

were insufficient to sustain high production after the veins or pockets were depleted. With the advent of World War II in 1942, the mines were shut down and men were directed to the war effort.

Throughout the war years, and until the 1960s, the lands of the project area continued to be occupied by a few rugged individualists and lonely miners, who from earliest days, supplemented marginal returns from mining by hunting, fishing, trapping, and growing gardens. Although the first truck roads were built into the area in the 1930s by the Civilian Conservation Corps, the rugged lands of the wild Rogue River have remained isolated and thinly populated. These same qualities of isolation and rugged natural beauty were appreciated by early recreationists, such as Zane Grey, and continue to be appreciated by hikers, rafters, and fishermen today. The discussion that follows provides context for understanding the history of the wild lands of the Rogue River in the Kelsey / Whiskey Project area.

Early Exploration and Immigration

The historic era in southwest Oregon dates from maritime explorers in 1775; however, the interior remained unknown to white explorers until 1827 when fur trappers from the British Hudson's Bay Company traveled through the Rogue River drainage (LaLande 1995: 12). Trapping brigades from the Hudson's Bay Company, as well as American trappers, visited streams of the region in the 1830s-1840s. They explored the Rogue River and Bear Creek, as well as streams in the Applegate drainage (McKinley and Frank 1996: 18-20). Wherever beaver were found, they attempted to trap them out so as to eliminate competition from American trapping companies (LaLande 1987).

The route followed by the Hudson's Bay trappers, using established Indian trails, coursed south from Fort Vancouver on the Columbia River, through the Willamette Valley, and across the Siskiyou Mountains to the valley of the Sacramento River (Figure 4). In the 1840s, the Siskiyou Trail became one of two major routes followed by immigrants on the overland trail to California. Settlers in the Willamette Valley used the route to collect cattle from California, and these cattle drives must have served to firmly establish the early road. The discovery of gold in California at Sutter's Fort in 1848 caused dramatic change. The trickle of hopeful settlers along the Oregon-California Trail in the 1840s was transformed into a wave of prospectors and gold seekers between 1849 and 1850. Many hopefuls who traveled the trail to the California mines were from the early settlements in the Willamette Valley (Walling 1884; cited in Hill 1976: 4).

The Oregon-California Trail traversed to the east of the present project area through southern Douglas and eastern Josephine counties. The route followed approximately that of present Interstate Highway 5 from Galesville to Wolf Creek, thence south across Coyote and Jumpoff Joe Creeks and on to Grants Pass. According to Walling 1884 (cited in Hill 1976: 5), "it was customary to traverse the "hill route," which lies over the Grave Creek and Wolf Creek hills, but sometimes the traveler chose a somewhat longer but more level course further

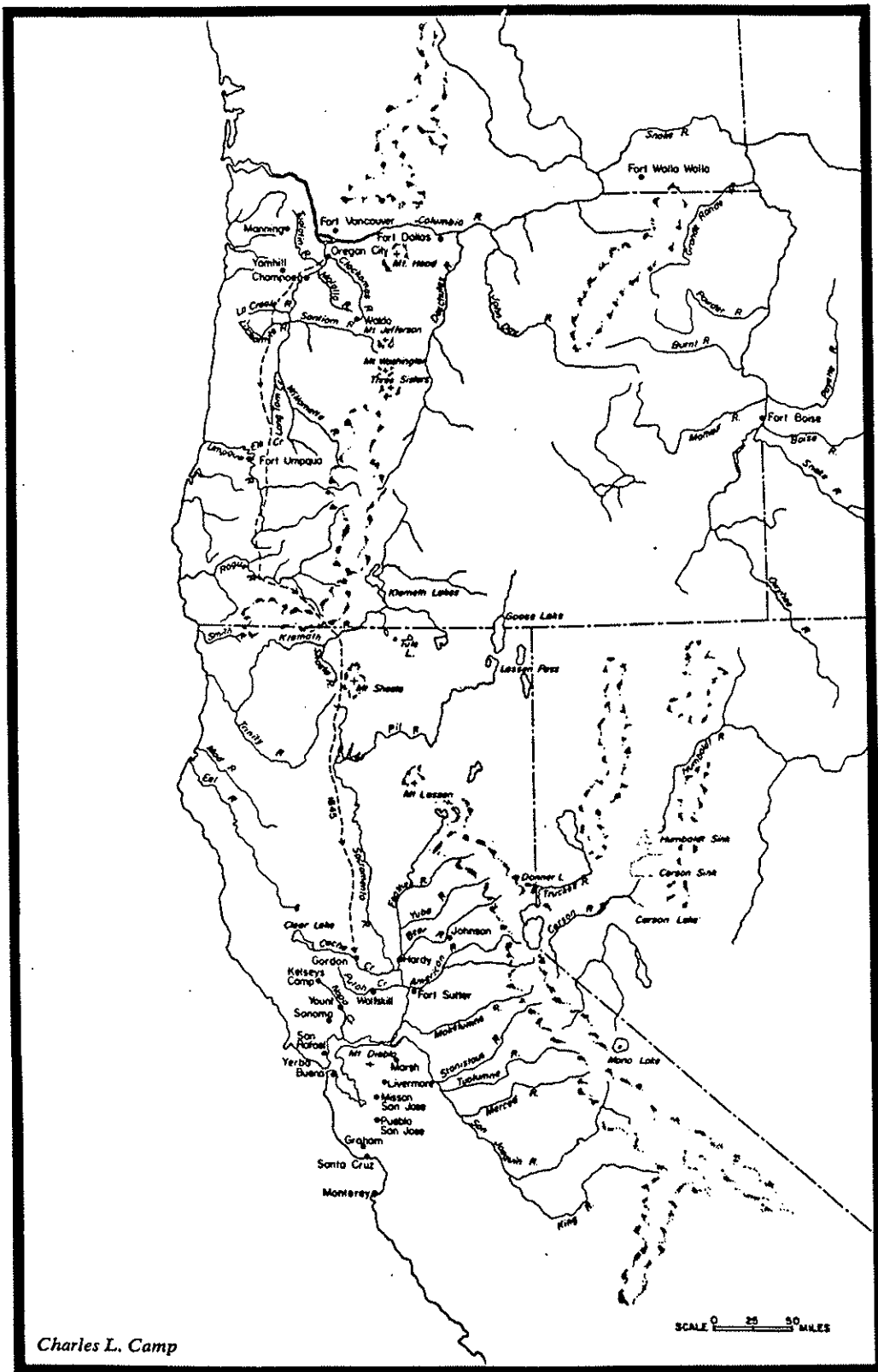


Figure 4. The Siskiyou Trail, explored by the Hudson's Bay Company beginning in the 1820s and established as the Oregon-California Immigrant Trail in the 1840s; based a map by Charles L. Camp in Dillon (1975: n.p.).

to the west and consequently crossing lower down those streams.” These routes were substantially those used by travelers in the early years and were the main arteries of traffic until the coming of the railway in 1883.

The Discovery of Gold and its Aftermath

The discovery of gold in stream gravels in southwest Oregon in 1851 opened an area little explored and virtually unknown to all but a few fur trappers. Within a few short years of its discovery, the population of southwest Oregon boomed, and towns and facilities were developed to serve the mines.

The first gold discoveries in southwest Oregon were along the Illinois River in 1851, with nearly simultaneous discoveries of very rich deposits at Sailors Diggings near Waldo and at Jacksonville. Although reports differ, a commonly accepted version is that the first discovery in 1851 was that of the Rollins party while en route to the California mines along the Oregon-California Trail. The party, which included Josephine Rollins and her father, were told by natives on the Rogue River that they could find “very rich mines a few days travel down the river ” (Francis 1988: 8; cited in McKinley and Frank 1996: 23). Guided by these friendly natives, they discovered “good surface mining” on the Illinois River at the mouth of Josephine Creek. “The news of their discovery was immediately communicated to the numerous and populous mining camps of northern California, and people began to move to the new diggings in considerable numbers” (Walling 1884; cited in Hill 1976: 4). The primitive Oregon-California Trail was transformed by the flood of prospectors and subsequent immigrants, crowded with mule and horse trains, and soon developed as a major wagon road. In 1853, Jesse Applegate surveyed the Military Wagon Road, and this route became the major immigrant route (Figure 5); however, the section of the wagon road passing from Galesville to present Grants Pass was at best a primitive rutted path until the late 1880s.

After the initial discoveries of gold on the Illinois, at Sailors Diggings, and near Jacksonville, prospectors spread out to explore all the major tributaries of the Rogue River. Rich deposits were found in gravel bars along the Rogue River at the mouth of Galice Creek southeast of the project area, and a major mining center developed here in the early 1850s. Important gravel deposits also were found to the east along the reaches of Graves Creek. Placer gravels along the wild section of the Rogue River in the vicinity of the Kelsey / Whiskey Project area, apparently were not developed until 1856, well after the initial period of excitement in adjacent mining districts between 1851-1853.

Early Settlement

The discovery of gold brought not only prospectors and miners but also settlers to serve the mining needs. Prior to 1850, there were no settlements in this part of the country, but there were stopovers for travelers at major crossings along the immigrant trail. One early stopover was located at Graves Creek Crossing at the present site of Sunny Valley. This was the original Leland town and early post office in 1855. Fort Leland was established here as a

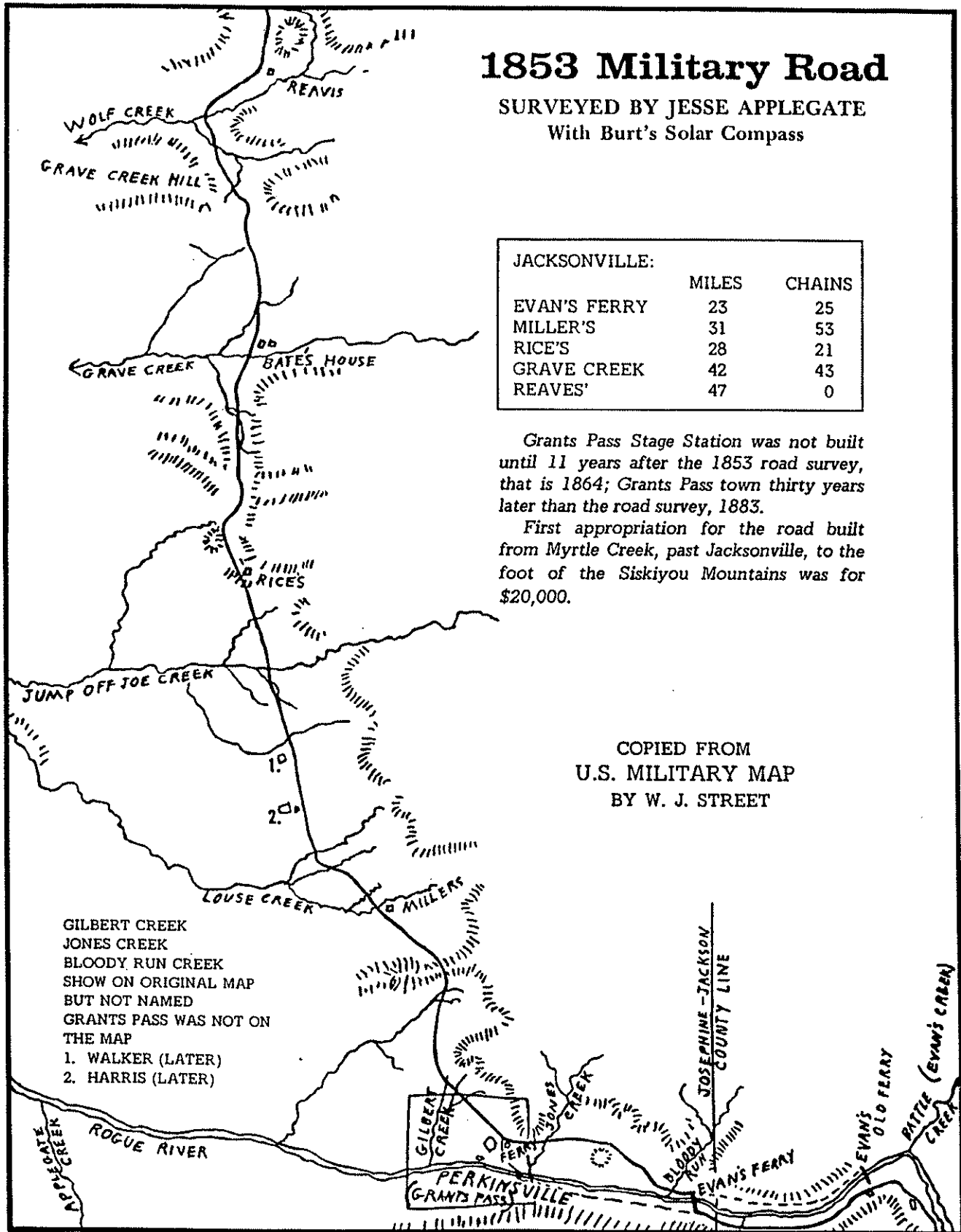


Figure 5. 1853 Military Wagon Road; based on one copied from the U.S. Military Map and annotated by W.J. Street (from Hill1976: xiii).

camp for the volunteer militia during the Rogue River Indian Wars of 1855-1856 (McLane 1995: 5; Beckham 1971: 162).

Small towns developed along the immigrant route and pack trails developed outward from early settlements to serve the miners located along the many placer streams. Galiceburg and Skull Bar were large miners' camps, and Galice later served importantly as a supply center for the miners scattered over the many smaller streams tributary to the Rogue (Street and Street 1976: 20). In the 1880s, the Oregon and California Railroad (Southern Pacific) was constructed along the same general route (Dillon 1975; McLane 1995). By 1883, the railroad was extended to the present town of Grants Pass. Leland was moved to the west to serve as a railroad station, and together with Glendale, served as the major supply centers for the miners located along the Rogue River canyon in the present project area (Hill 1976: 33-35; McLane 1995: 2).

The best valley farmlands in the Rogue River Valley were settled under the provisions of the Oregon Donation Land Act between 1850 and 1855. Selecting 160- to 320- acre tracts, claims were filed on prime agricultural lands along the Rogue River and its major tributary streams. The earliest Donation Land Claim in Josephine County was taken up in May, 1852, by James ("Uncle Jimmy") Twogood at Graves Creek Crossing along the California-Oregon Trail (Street and Street 1976: 19). This site, operated by Barney Simmons, had originally served as a stopover for travelers along the immigrant trail; it subsequently was developed as a hotel by A.S. Bates and James Twogood, and then by Twogood in partnership with McDonough Harness and served the needs of both travelers and miners.¹ On the 1853 Military Wagon Road map, it is shown as "Bate's House" (Street 1976: Map of 1853 Wagon Road) (see Figure 5). Lands in the Kelsey / Whiskey Project area were mountainous and unsuitable for agriculture, and no farms were located along the wild Rogue lands by Donation Land Claims.

Contact and Conflict, 1851-1856

The flood of prospectors and settlers into southwest Oregon had serious consequences for native peoples settled along the Rogue River and its many tributary streams. Between 1851 and 1855, numerous confrontations occurred between native peoples and the newly arrived settlers and miners who had displaced local Indians from their traditional villages located along the tributaries of the Rogue River. Local newspapers were filled with reports of Indian attacks on isolated homesteads as well as accounts of lonely prospectors, packers, and miners who had been wounded or killed by surprise attacks (cf., Street and Street 1973: 20-21; McKinley and Frank 1996:38-41).

¹Harkness got the first post office in Josephine County in 1855; he was killed by Indians during the Rogue River Indian wars in 1856 (Street and Street 1975: 19).

Prior to 1851, conflict between the various groups of native peoples located along the Rogue River and its tributaries, called the Rogue River Indians², were limited to brief attacks on drovers and immigrants along the Oregon Trail to California. The flood of prospectors to southwest Oregon initiated more serious conflicts between native residents and the newcomers. Between 1851 and 1853, there were numerous reports of Indian attacks on isolated miners prospecting along streams, packers along the trail, and isolated homesteads. In retaliation, miners and settlers organized groups of volunteers and conducted indiscriminate and vicious retaliatory raids on any native group they happened to encounter, and often exercised little or no regard for establishing specific responsibility for the attacks. This enraged the Indians of many different groups and they retaliated in kind (Beckham 1971; McKinley and Frank 1996).

This early conflict period was brought to a temporary close by a peace treaty signed near Table Rock in September 1853 (Beckham 1971: 123-124). A reservation was established "...as extending up Evans Creek to a small prairie, across the mountains to upper Table Rock, south to the Rogue River, and down the river to the mouth of Evans Creek" (Beckham 1971: 124). The treaty was signed by Joel Palmer, Superintendent of Indian Affairs for Oregon, Samuel H. Culver, the new Indian Agent for the Rogue Valley, and eight headmen representing 287 Indians (Beckham 1971: 124). To protect the peace, Fort Lane was established as a permanent military camp about a mile below Table Rock on the south side of the Rogue River.

Only about half of the Rogue River Indians accepted the treaty conditions and went to live under the agent's supervision on the reservation. The more warlike held out, moving to more remote villages and upland valleys. Among those who did not sign the treaty was the Headman Tipsey, whose band had been centered on Bear Creek and the adjacent Siskiyou. He was a militant and untamable leader, despised his kinsmen who acceded to treaties, and had Tyee Jim, a friend of the whites, assassinated. For a time he continued attacks on miners and packers in the Siskiyou Mountains, but Tipsey was killed by the Shastas on the Klamath River where he had gone to recruit the Shasta in his war of retaliation against the whites. The Shasta were praised by the regular military forces for this act, but they were paid a horrible tribute by the volunteer militia. Sixty Indian people were taken from the village and marched down the Klamath River for containment at Fort Jones. When they stopped to bathe at Klamath Ferry, the militia opened fire and massacred all -- men, women, and children (Beckham 1971: 142-143).

²The term "Rogue River Indians" was used by early explorers and immigrants to refer to many different bands encountered along the Siskiyou Trail and later Oregon-California trail in southwestern Oregon. The Rogues composed several different Athabascan bands resident in the Rogue Valley, the foothills of the Cascades and Siskiyou, along the lower Rogue River, and along the coast. The separate bands both individually, and in concert, attacked settlers along the immigrant trails and conducted hostilities known as the Rogue River Indian Wars. Several Shasta bands, who joined the resistance between 1851-1856, also were included as Rogue River Indians.

The winter of 1853 was harsh, and the Indians living on the Table Rock reservation were starved and decimated by disease. In the summer of 1854, roving bands of miners, self-organized volunteer militias were bent on extermination of the Indians. They prowled the mountain trails and attacked unsuspecting villages, creating great fear and consternation for the Indians residing on the reservation (Figure 6). Many left the reservation that summer, and others were ready to flee to the safety of the mountains. The Indian superintendent, Joel Palmer, reported in September 1854 (cited in Beckham 1971: 144):

I found the Indians of the Rogue River Valley excited and unsettled. The hostilities of last summer had prevented the storing of the usual quantities of food; the occupation of the best root grounds by the whites greatly abridged that resource; their scanty supplies and unusual severity of the winter had induced disease, and death swept away nearly one-fifth of those residing on the reserve. Consternation and dismay prevailed; many had fled and others were preparing to fly to the mountains for security .

A few warriors from Tipsey's band survived in their haunts in the mountains, and in the autumn of 1855, conducted a series of raids and petty thefts against the Rogue Valley settlers. In September, they attacked teamsters along the Siskiyou Trail and killed two of them while a Shasta killed a miner who had taken his wife. This provoked the miners to form a large militia force, which attacked a sleeping village on Butte Creek near the reservation (Beckham 1971: 152). Surprising the sleeping Indian camp, they killed fifteen women and children and eight men (Walsh 1972: 1). This was the final betrayal for the Rogues on the reservation. The warriors took up arms, murdered an agency employee, and fled the valley set out to take vengeance for all that they had endured. This began a year of intense hostilities known as the Rogue River Indian Wars of 1855-1856.

Rogue River Indian Wars, 1855-1856

After the massacre on Butte Creek, those who did not want to fight sought the protection of the army at Fort Lane. The warriors who left the reservation, gathered forces from several scattered bands and swept down the Rogue River, attacking ranches, and killing all whites encountered. On October 9, 1855, warriors from several bands killed at least 20 people along the Oregon-California Trail between Evans Creek and Grave Creek (Walsh 1972: 3). On October 17, Indians attacked the settlement at Galice and nearly overwhelmed the poorly defended position. The battle lasted over eight hours; the miners suffered fifteen casualties and four of the wounded died later (Beckham 1971: 155).

The perspective of the whites was that of fear and outrage; there was no comprehension that native peoples had been displaced from traditional fishing sites along the rivers or that their acorn and camas gathering areas had been converted to pastures or miners' camps. Miners and settlers built palisades and dug trenches around cabins to serve as fortified retreats; several of these makeshift quarters came to be known as Fort Birdseye, Fort Vannoy, Six Bit House, and Fort Bailey (Figure 7). A regiment of volunteers was commissioned, consisting of about 500 men in nine companies. Meanwhile, the regular army



Figure 6. Volunteers on the march in Rogue Country (Glisan 1874; from Beckham 1971: 111).



Figure 7. Military Forts and Camps 1851-1880. Compiled by Works Projects Administration in the 1930s, but never completed; from Preston (1970: n.p.).

troops had to protect more than 300 peaceful Indians camped at Fort Lane from the volunteers (Beckham 1971: 153-155).

The warring Rogues had retreated to camps hidden in the rugged lands of the Grave Creek Hills, but were discovered by a surveying party laying out a route from the coast in October, 1855. As the survey party approached the Oregon-California Trail north of Graves Creek, they were attacked by Indians camped nearby. They escaped, but the attack served to identify the location of the Indians' hideout (Beckham 1971: 157-158). Within two weeks, a large force of 300 volunteers and 104 U.S. army regulars was organized and set out to attack the large concentration of Rogue River Indians gathered in the hills north of Grave Creek. The ensuing battle, known as the Battle of Hungry Hill, was disastrous for the military force. Twelve men were killed and twenty-six wounded when the Indians withdrew, and the exhausted troops and volunteers marched back over the mountains to the settlements. An account by Lt. George Crook, who was stationed at Wolf Creek, noted: "the troops left the Indians monarchs of the woods" (cited in Walsh 1972: 4).³

After the Battle of Hungry Hill, the upper Rogue River Indians retreated to the wild portion of the Rogue River, in the present Kelsey / Whiskey Project area, to spend the winter. An expeditionary force composed of regulars and volunteers was organized under Captain Judah and proceeded on November 21st to pursue the Rogues into their mountain stronghold along the Rogue (Figure 8). They camped near the mouth of Whiskey Creek and followed a tortuous route along the ridges above the canyon until they reached Little Meadows. Here they found an open meadow with ample grass to pasture their horses. From Little Meadows, they could see the campfires of the Indians some five or six miles up the river. Scouts sent out the next day reported that 150 men and their families were fortified in a nearly impregnable position on the lower end of a bar at a very narrow portion of the canyon (Beckham 1971: 161). The Indians likely were camped on present Tyee Bar (Cooper 1937 (II): 5); however, Black Bar is thought by some to be the location of the Indian camp (Atwood and Gray 1996: 63).

³Considerable disagreement about the location of the battle of Hungry Hill is found in the historic sources. Early historians (Walling 1884; Bancroft 1888; Victor 1891) relied on newspaper accounts that lacked accuracy in many respects. Richard Helm, who purchased part of the Grave Creek Ranch believed he had located the battle site in Section 17, (T.33S., R.7W.), and this discovery was published in the Golden Anniversary edition of the Grants Pass *Courier* in April 1934. This became widely accepted as the battle site. Careful analysis of original diaries and interviews with descendants of the militia men by Larry McLane (1995: 13-16) suggest that the published location is in error. According to McLane (1995: 15-16) the site that most closely corresponds to the accounts of the battle site is in Section 26 (T.33S., R.8W.); it has a meadow, grub-oak thicket, spring, and a canyon to the west with rock bluffs that old timers called the Falls which match Jimmy Twogood's 1909 account (*Rogue River Courier*, March 12, 1909; cited in McLane 1995: 11-13). When the oak trees near the spring now known as Bloody Spring were cut for firewood, a water bucket was nearly filled with musket balls collected while splitting the wood (McClane 1995:16).

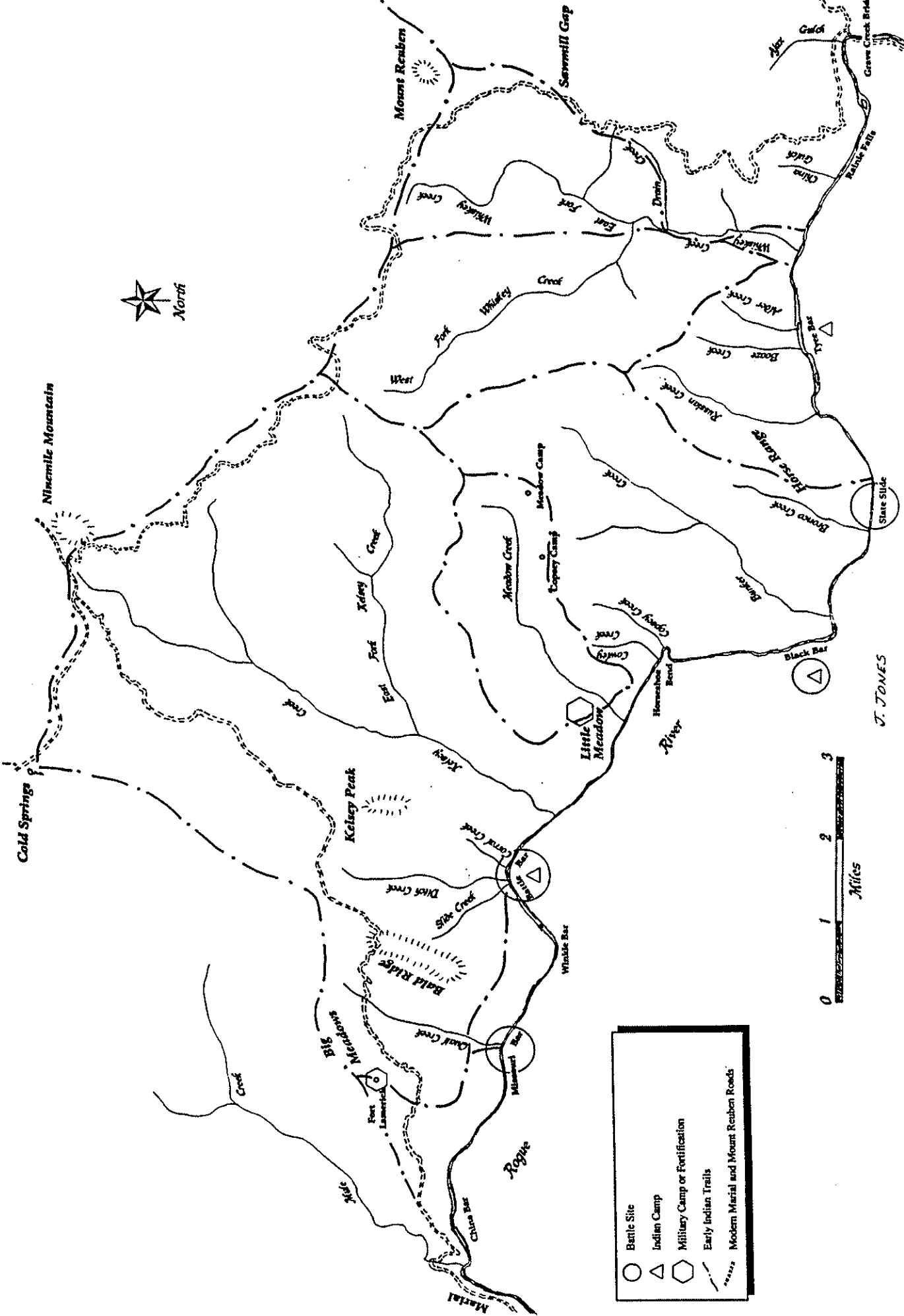


Figure 8. Indian camps, battle sites, and militia fortifications located in the Kelsey / Whiskey project area during the Rogue River Indian Wars 1855-1856.

Meanwhile, another company of 246 men under Major Bruce had marched to a point about three miles below the Indian camp, near the mouth of Bronco Creek (Cooper 1937 (II): 5). The two companies hoped to get the Indians in a crossfire across the river, with Captain Judah's forces attacking from the north and Major Bruce's from the south. Captain Judah took his troops to a point on the ridge above the Indian Camp. Major Bruce's men, located on the river near the mouth of Bronco Creek, began to build rafts to cross to the south side of the river. The noise of the raft building alerted the Indian Camp, and the Indians attacked. The position of the militia was very exposed, and the men were not prepared. The volunteers scrambled to find protection behind rocks and trees along the riverbank and the parties exchanged shots throughout the day. The location of this altercation was near Slate Slide.⁴ Four volunteers were wounded and one killed while the Indians lost two or three men - this against a militia force more than five times their number. After several hours a retreat was made to the point on the ridge several miles north of the river where Captain Judah's forces were located. A general retreat was then made and the campaign given up until spring (Beckham 1971: 160-162; Walling 1884; Walsh 1972). The November 1855 expedition was called the First Meadows Campaign.

The Rogue River Indians camped along the wild section of Rogue River were protected from the volunteers by the rugged mountains during the winter of 1855-1856; some apparently moved down river to the vicinity of Big Bend, which had been vacated by the miners, while others remained hidden in inaccessible canyons. In the meantime, the valley Indians camped at Fort Lane, as well as other friendly groups living under the protection of regular troops, were removed to distant reservations. More than 400 Indians at Table Rock were marched over the mountains to the Siletz Reservation in the Willamette Valley in early winter of 1856 (Beckham 1971: 166).

The lower Rogue and coastal bands maintained friendly relations with the early miners and settlers up until the fall of 1855, but attacks on their villages by volunteer militias, and agitation from valley Indians pushed down river from the mountains, provoked an uprising of the coastal peoples. Warriors from the lower Rogue and coastal bands gathered forces and attacked the settlement at Gold Beach in February of 1856. They killed 23 whites, burned 60 houses, and lay siege to Fort Miner for 27 days, hoping to starve the settlers out (Beckham 1971: 173-175; Walsh 1972: 7-10). The combined Indian force burned settlements all along the coast and on the lower Rogue River and maintained control of the lower river between their main camp at the mouth of the Illinois River and the coast for two months.

In the middle of March, the military organized a large force, composed of both army regulars and volunteers, and set out a plan of action that would attack the Indians on several fronts. One force relieved the sieged miners and settlers at Fort Miner and secured the coast.

⁴The location of the skirmish is sometimes given as Black Bar (Purdom 1977: 5). While constructing a camp at Slate Slide in 1937, the Forest Service crew "...dug an old cap and ball 5-shooter pistol out of the decomposed slate. It was fully loaded and was perhaps lost during the mad scramble to shelter to escape the Indian fire" (Cooper 1937 (II): 5).

Three other companies were to converge on the Indian stronghold on the Rogue at the mouth of the Illinois River, but were unable to successfully coordinate their attack and returned to the coast. All villages located along the return march were burned (Beckham 1971: 178-182; Walsh 1972: 7-10).

With the arrival of spring, the main volunteer forces, many of which had remained at Fort Leland since the previous November, were spurred to action against the Rogues. In late April, the Second Meadows Campaign was organized; a joint expedition of Oregon Mounted Volunteers totaling 535 men, under the leadership of General John K. Lamerick, left Camp Leland and moved against the remaining Indians camped along the wild Rogue River. On April 23, they arrived at their earlier camp at Little Meadows. Scouts reported a large number of Indians located along the river between their camp and Big Meadows (in the present project area). Several attempts to lure the Indians out of their protected positions failed, so a contingent of 100 soldiers marched silently over the ridges above the river, moved down to the edge of present Battle Bar, and hid in the heavy brush along the river (Beckham 1971: 182-183; Walsh 1972: 13-14).

The volunteers launched the surprise attack on the Indian camp at Battle Bar on April 27, and according to Col. Kelsey's report, "20 or 30 of the enemy were killed" (cited in Walsh 1972: 14). Reinforcements arrived that afternoon, and the attack continued until dusk. According to a local newspaper report, the Indians cried for peace throughout the day, but the troops were in no mood to stop the war (*Table Rock Sentinel*, May 17, 1856; cited in Beckham 1971: 183).

The volunteers withdrew to Big Meadows, and another shorter battle occurred the next day as the militia attempted to cross the river near Quail Creek. By the first of May, with supplies running low, several companies left Big Meadows and took an old Indian Trail over the ridge to the north to Camas Valley, thence back down to Fort Leland. Five companies remained in the mountains and built a stockade which they called Fort Lamerick after their leader. The Indians left their stronghold on the wild Rogue and moved downstream to Big Bend. Here, the last bitter battle of the Rogue River Indian Wars was fought on May 27, 1856. Between the end of May and the end of June, all of the bands under the leadership of the warring headmen surrendered. The survivors were removed to the Siletz Reservation on the coast more than 175 miles from their native homelands (Beckham 1971: 186-189; Walsh 1972: 15-16).

In subsequent years, the Indian survivors of the Rogue River Wars repeatedly requested that they be returned to their homes in the Rogue River Valley. At a meeting of the headmen at Siletz in September 1857, called by Special Indian Agent J. Ross Browne, headmen of the bands that fought the Rogue River battles in 1855-1856 pointed out the promises made at the Treaty at Table Rock in 1853 and the fact that they had never ceded the reservation lands. Headman George's words to Browne that September of 1857 are eloquent (cited in Browne 1977: 45):

When Palmer was buying our lands, we sold him all our country except two small tracts, one on Evans Creek and one on Table Rock. That portion was reserved for our own use. We did not sell it, and such was the understanding when we signed the treaty. I would ask, am I and my people the only ones who have fought against the whites that we should be removed so far from our native country. It is not so great a hardship to those who have always lived near here. But to us it is a great evil. If we could be even on the borders of our native land, where we could sometimes see it, we would be satisfied.

The Rogues were never returned to their valley reservation. With the removal of the Indians, miners returned to work their claims and settlers to build their farms. One consequence of the Meadows Campaign in 1855-1856 appears to have been the discovery of gold in the placer gravels along the wild section of the Rogue River.

Placer Mining on the Rogue River

In the early 1850s, rich gold placer deposits were found in the gravels along the lower Rogue River in extensive formations both upriver and downriver from the Kelsey / Whiskey project area. Numerous placer mining operations were opened along Grave Creek and along the Rogue near Galice as early as 1852-1853. Several mines near Galice, major operations in the early period, were reopened and expanded in the early 1900s, and intensively worked using hydraulic methods in the 1930s. The Alameda Mine claims contained lode as well as placer deposits and lode deposits produced copper as well as silver and gold (Libbey 1967). Miners along this portion of the Rogue had access to high bench gravel deposits as well as streamside gravel bars, so that the history of placer mining continued into the twentieth century. Rich placers downstream from the present project area also were located early and worked intensively, in particular, those located near Big Bend and at the mouth of the Illinois River. Although prospectors may have visited the wild section of the Rogue in the early 1850s, there is no record of mining before 1856 (Diller 1914; Butler and Mitchell 1916; Youngberg 1947; Brooks and Ramp 1968).

A placer deposit is one where the gold has been redeposited from its original position by alluvial or colluvial means. The source of the auriferous gravels along the Rogue River in the project vicinity derive from intrusive quartz diorite and related rocks in the Rogue Formation, which outcrops along the east side of the project area and along Mule Creek west of the project boundary (Figure 9). Gold was especially concentrated along the contact between the Rogue Formation on the east and the sandstone Dothan Formation on the west in the vicinity of Whiskey Creek (Diller 1914: 14-18; Youngberg 1947: 1-2). This zone of metamorphosed rocks, the contact between serpentine and greenstone, provided the ore mined from lode deposits in the early 1900s and this, and earlier related formations, were the source of the auriferous gravels along the Rogue River. "One of the most important conditions contributory to the formation of rich auriferous gravels is the deep weathering and disintegration of rocks that contain gold-bearing quartz veins. By this means, the gold is

liberated in the residual material and prepared for concentration by the streams in their gravel beds” (Diller 1914: 14). The Dothan Formation is largely sandstone and devoid of gold, so that gold found in river placers downstream from Whiskey Creek were derived from erosion of the Rogue and earlier related formations.

Early Placer Mining along the Wild Rogue River, 1850s-1880s

The mountainous lands along the rugged reaches of the wild Rogue River in the vicinity of the Kelsey / Whiskey Project area remained unexplored and undeveloped until somewhat later than other parts of southwest Oregon where large mining communities formed at major placer discoveries. Its rugged, dissected terrain made it difficult of access and the wild reaches of the Rogue, with its steep canyon walls, forestalled early prospecting and exploration. Although specific dates of gold discoveries are not recorded, the major movement to this area appears to date to 1856, directly following the period of conflict known as the Rogue River Indian Wars (Mickey 1974: 30).⁵

John Mickey was prospecting near Jacksonville in July of 1856, without success, when he first heard about the placers along the wild Rogue. “There was great talk about good diggings seventy miles down the Rogue River” (Mickey 1974: 30). The newspapers in Jacksonville were filled with stories recounting the success of the volunteer forces against the Rogue Indians earlier that spring and also apparently about new placer diggings discovered near Big Bend, which he called Big Meadows.⁶ Mickey, together with his uncle and a friend from back home, set out on horseback to Big Meadows, which according to Mickey (1974: 30) was “...the place where the soldiers fought the Indians and the volunteers came in and saved the U.S. Army.... We went by way of Leland, on down Grave Creek, and across a very high mountain [Mt. Reuben] down to Whiskey Creek where we camped.” The three men found “...no evidence of white men - nothing but Indian tracks” on Whiskey Creek and retreated back up the ridge the following day where they encountered eighteen other prospectors. Feeling safe in this larger group, the prospectors headed to Big Meadows. “We expected to see a thriving town, but to our great surprise there was not a man, not even a track. All the talk about Big Meadows was just humbug. We prospected a bit but found nothing”(Mickey 1974: 30).

⁵The early placer mining era along the wild reaches of the Rogue River are poorly documented (Purdom (1977). The diary of John Murray Mickey is one of the few primary sources for mining in the area and covers the years between 1854-1859 (Mickey 1974); his accounts place the discovery of gold in the area to 1856.

⁶Big Bend near present Illahe often was called Big Meadows at the time of the Rogue River Indian Wars in 1855-1856, but also had common usage for the meadows where Fort Lamerick was built in 1856. The town that Mickey expected to find would have been a small settlement of miners located at Big Bend in the early 1850s; the miners abandoned the settlement in 1855 and the Rogue Indians burned the buildings (Beckham 1971).

Mickey's account suggests that no one had previously been working along Whiskey Creek or anywhere along the wild section of the Rogue River before the summer of 1856. This is consistent with the use of the area as a hideout and retreat for the Rogue Indians in late 1855 and early 1856.

In the summer of 1856, however, many miners were at work on the placer gravel bars along the wild Rogue. From Whiskey Creek down to the Illinois confluence, auriferous gravels were found concentrated in the river-bars. Near the mouth of Whiskey Creek, "...slates and gravel deposits reappear in the Lower Rogue River District and continue for many miles with much irregularity to the mouth of the Illinois River" (Diller 1914: 114). It was on these deposits, most located on gravel bars located at or close to river level, that the early miners focused attention: mouth of Whiskey Creek, Tyee Bar, Black Bar, Horseshoe Bend, Battle Bar, Winkle Bar, Missouri Bar, China Bar, and mouth of Mule Creek (see Figure 8). Whiskey Creek contained extensive gravels and was placered for a distance of four miles between its mouth and Huckleberry Flat on its east fork. "There is no record of output but the amount of yardage moved indicates that a substantial amount of gold was recovered" (Youngberg 1947: 1).

In the early years, miners used simple technology. The common method used by solitary prospectors involved panning the gold from the gravels using water from the river. A slightly more advanced system used rockers, cradles and long toms (Figures 13 and 14).⁷ Gravels were shoveled into a wooden box, buckets of water were added, and the box was shaken to release the gold. The "shoveling-in" and transport of water required considerable effort and much of the fine gold was lost. The invention of the sluice was a great energy saver. Gravels were shoveled into the sluice boxes, a stream of water was diverted from the river into the sluice, and the gold was collected in riffles located in the bottom of the sluice box (Rinehart 1962). Mickey (1974: 25) claims to have brought the invention to southwestern Oregon:

I claim to be the first man to start sluices in the Jackson mines. I had seen some sluices as I went through California, and took particular notice of them, how they were made and set. I got some lumber sawed to order, made sluices and used them. We could make sluices pay when we would have been starving with Long Toms.

The great advantage of the sluice is in the manipulation of water. Instead of hauling buckets, water was diverted to the sluice where the gravels were washed. Furthermore, more of the fine gold could be recovered by coating the riffles in the bottom of the sluice with mercury (quicksilver) which served to amalgamate for higher recovery. The diversion of water in these early systems were direct predecessors to later hydraulic mining techniques (LaLande 1985: 31).

⁷Long toms were simply longer rocker boxes and usually operated by a small company of miners.



Figure 10. Miner working claim with simple technology, pouring water into a rocker cradle and with pan, pick and shovel close at hand; from Southern Oregon Historical Society Photo Collection.

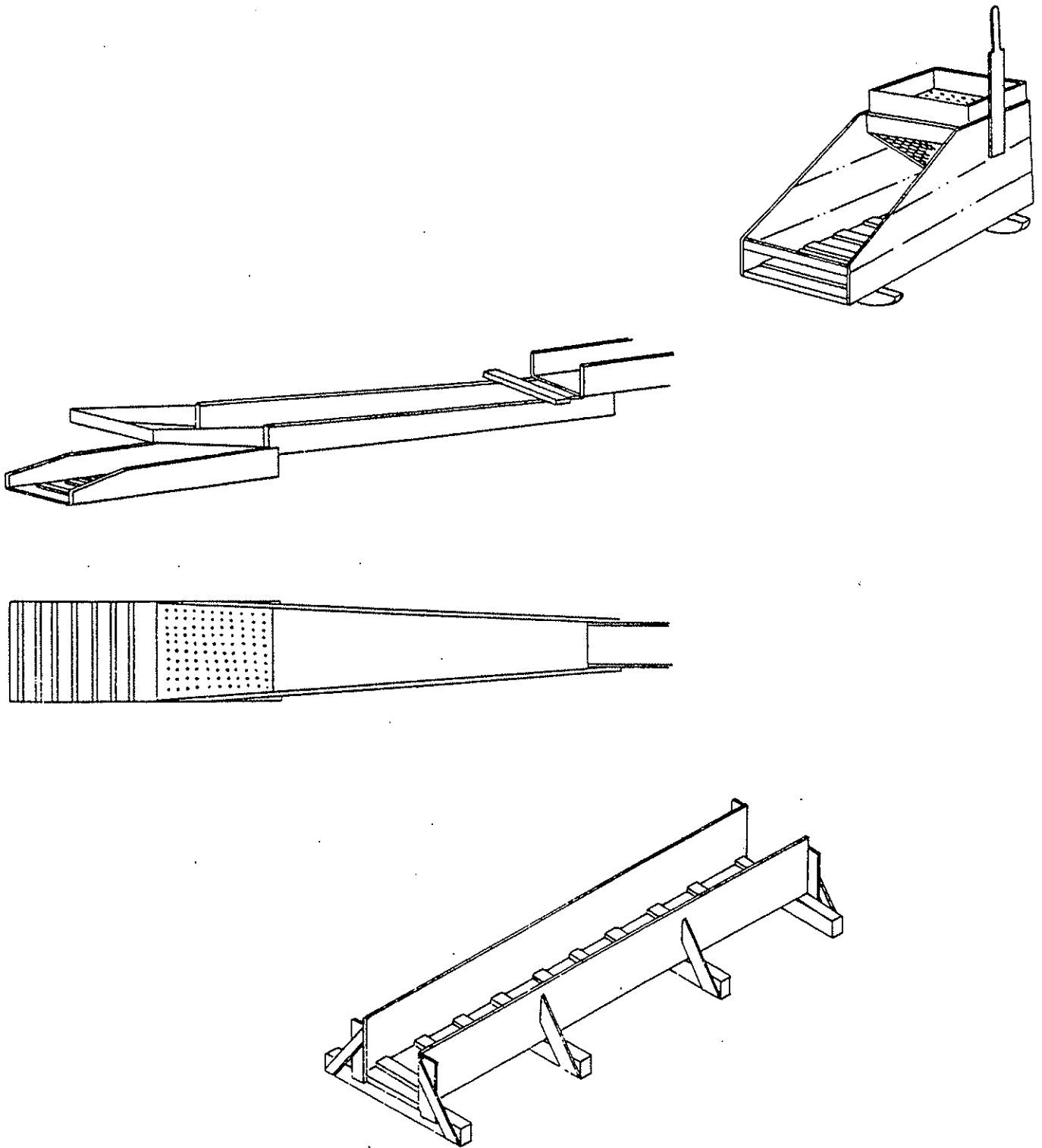


Figure 11. Basic gold recovery equipment developed during the early placer mining era: rocker box, long tom, and sluice box; from LaLande (1985: 32).

None of these early methods required much investment, and the nearby forests provided wood needed for sluices and troughs to divert the water, as well as simple shelters and cabins. For simple sluicing methods, water to wash the gravels was diverted directly from the river via wooden troughs. Often, these were built directly along the river bank and required only sufficient slope to keep the water moving. Even using such simple methods, two or three men often worked together on a claim. After discovering a good prospect on the south bank of the river at the mouth of Whiskey Creek, Mickey and his uncle teamed up with two others who owned the water rights. One man ran the whip saw (rented for \$2 a day) while three others cut the wood for 600 feet of trough to run the water to the bar. "Within three weeks we were sluicing, having started sawing on August 12, 1856" (Mickey 1974: 31).

By the winter of 1856, Mickey's company had taken out about \$2,200 using simple sluicing methods. They moved to a richer claim on Tye Bar that promised good returns, built a cabin to house the group over the winter, which had grown to seven men, chartered a mule train to haul in provisions, and decided to invest in a hydraulic mining system.

Hydraulic mining technology began in California in the 1850s and spread rapidly to the miners in Oregon (LaLande 1985: 31). Hydraulic mining requires a steady stream of water and sufficient volume to develop pressure, hence, it requires significant investment in the development of necessary water supply systems. Only those claims that had definite promise would justify the investment of time and expense to mine it hydraulically. The principal involved diverting water from a source located above the placer deposits and confining it in progressively smaller pipe to a control point where it produced a powerful spray. The earliest methods used a flexible hose fitted to a nozzle that could be directed to the gravels to be pressure washed (Evans 1883). This is the method used by early hydraulic operations, such of those employed by Mickey's company, on the Rogue River in the 1850s. An improvement was the monitor, invented around 1865, which could generate much higher pressure and was employed by industrial hydraulic operations beginning in the 1870s (Figures 12 and 13). "It resembles a piece of military or naval ordinance....united to the supply-pipe at the breech with a water tight-tight socket joint...and ballasted with a carriage extending backward from the breech and loaded with rocks" (Evans 1883: 5). The monitor could handle very high pressure while the nozzle could be directed easily on a pivot (Evans 1883; LaLande 1985; Tonsfeldt 2000).

To get the necessary water supply to hydraulically work their claim on Tye Bar, Mickey's group built a wooden flume one mile long (Mickey 1974: 32-33):

We bought a couple of whipsaws and began cutting 16-foot lengths of lumber for the flume. It was to be 18 inches wide and 14 inches high, made of single widths of planks....The flume crossed canyons, and stuck up on poles twenty-five feet high, and part of the way it was on the mountainside, so steep we had to lash ourselves by ropes to the trees to keep from falling down the mountainside....The flume had a drop of a quarter-inch to the rod, and at the lower end was forty feet above the river.

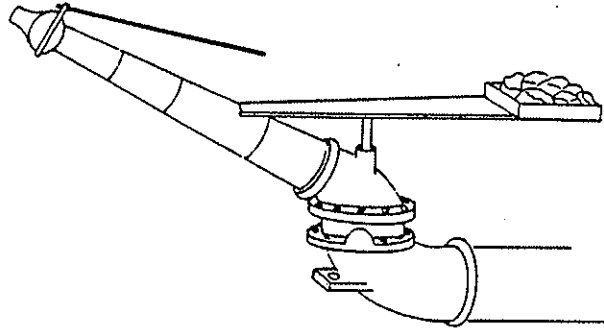


Figure 12. Schematic illustration of “giant” nozzle or monitor, showing deflector tip, deflector lever, wooden counterweight platform, and pipe from penstock; from LaLande (1985: 34).

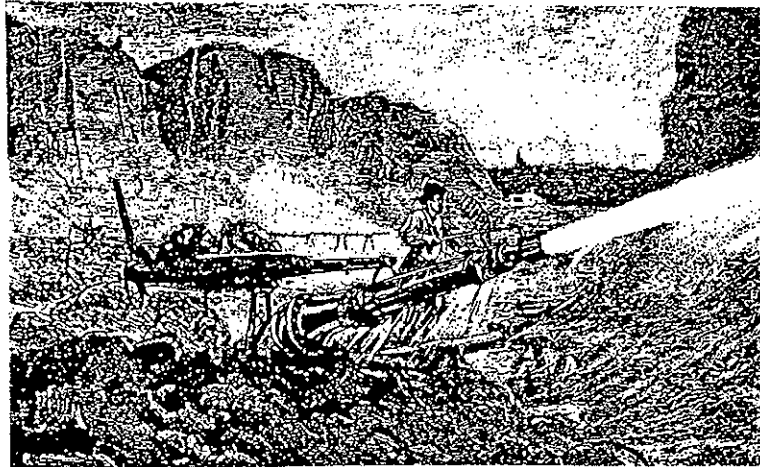


Figure 13. Monitor at work; from Evans (1883: 5).

They made good money from their Whiskey Creek claims so that they could afford to put considerable investment in the promising claim on Tye Bar. They had built a fine cabin, "it was a very good miners' house, with good floor and glass windows, best of bunks, a good fireplace and kitchen, and a cook hired at fifty dollars a month." Provisions, including 600 pounds of potatoes and 200 pounds of onions, and mining equipment, including axes, saws, augers, planes, draw knives, and picks and shovels, were packed in at a cost of \$1400. They hired two men to help with the sawing of lumber for the flume and another packer to carry the lumber: "it was quite a trick to maneuver a board of lumber 18 inches broad and 16 feet long around the mountain trails." A landslide took out part of the flume, and it cost \$300 to repair the damage. By late December, they were starting to get into debt (Mickey 1974: 33).

They got the water to Tye Bar in July of 1857; it had taken ten months to build the flume. To their surprise, the mine did not pay as they expected. "We were in debt \$75 apiece. We abandoned the bar and took to the river and turned it, but found very little there either" (Mickey 1974: 34). They dammed the river, but that did not pay, "not even wages." They set everyone to prospecting the back part of the bar and made a large hydraulic cut into the bank. "The cut was 40 ft. wide on top, thirty feet wide on the bottom, and 300 feet long, and thirty feet deep" (Mickey 1974: 35). They worked on it for three months and got \$600 out of it, an average of \$2 a day each -- expenses ran \$1 a day a piece.

In spite of the low returns, Mickey thought the hydraulic method was a great invention. "It does the work of twenty men and is not half as dangerous as pick and shovel. You just stand back and play the water under the bank till she caves in, then wash it off, then repeat, and down she comes.... If the Rogue River had water fall enough we could run it through a cannon -- if the cannon was big enough" (1974: 37).

Mickey sold his claim and left the Rogue River in August 1859. The total recovery from Tye Bar was \$11,877, and Mickey had a total of \$1,400 left over. "We had been here three years, expenses great, everything high, even the mountains" (Mickey 1974: 38). Many of the original miners left by 1860. Some were attracted to the new discoveries on the Fraser River in British Columbia in 1857 which in turn, led to another large rush to Idaho. In the early 1860s, the richest gravel bars on the wild Rogue River were considered worked out. Many claims considered worthless were sold to the Chinese.

Chinese Miners

In 1855, Chinese miners moved into southwestern Oregon to participate in the region's mining boom (LaLande 1985). Although they were not permitted to locate mining claims, they could purchase them from other miners. "Claims the whites did not consider worth working, they sold to the Chinese" (Street and Street 1973: 33). They were efficient miners, often worked together in groups, and were satisfied with lower returns. This stood in sharp contrast to the prevailing white miner's ethics of individualism and get-rich-quick. Physically distinct, culturally different, and separatists by choice, the Chinese were subject to considerable harassment from white miners.

By 1856, a group of Chinese attempted to buy the rights on Tyee Bar, but were dissuaded by the high level of animosity of the old Indian fighters prospecting on the river. Mickey and company had been approached by a man representing a group of Chinese miners in July 1857. They initially agreed to sell out to the Chinese for a total of \$12,600, but the representative never returned. "Some of the old Indian fighters said Chinamen should never come into these parts. Someone warned the Chinese about the Indian fighters, so they backed out" (Mickey 1974: 33). When the Rogue placers were considered mainly worked out by around 1860, Chinese miners moved onto the Rogue River placers and several remained there until the early 1880s. Heavy returns, as much as one million in gold dust, were taken out of Tyee Bar (Purdom 1977).

Little is documented specifically about the Chinese on the wild Rogue. Their presence is best recorded by the places that bear their names: China Bar, China Riffle, and China Gulch are reminders of their presence (Atwood and Gray 1996: 97). China Bar is named for a miner named Chow Long who mined along the bar that presently bears his name. The site of his cabin and empty grave is located about 100 yards above China Riffle. His bones were dug up by unidentified Chinese and presumably were returned to his homeland in China (Atwood 1978: 98). According to their religious beliefs, their souls would not rest unless they were buried in their China homeland (Pfefferle 1977: 36-37). In the early 1880s, animosity against the Chinese ran especially high and they were denied citizenship by passage of the Chinese Exclusion Act in 1882. Although present in small numbers along the Rogue in 1870, according to census records, by 1880 there were almost no Chinese left along the river (Atwood and Gray 1996: 98).

Hydraulic Mining in the early 1900s

All the gravel bars and the lower reaches of tributary streams in the Kelsey / Whiskey Project area were worked during the early placer era; however, only the Red River Mine at the mouth of Mule Creek had significant production after the early placer era ended about 1860. The gold bearing gravels located along the Rogue between the mouth of Grave and Mule creeks were mainly found in deposits close to or within the riverbed. Gravel benches situated along the river were explored and hydraulically mined, to the extent possible, during the 1850s, but development was limited to those areas where water could be diverted to wash the gravels.

The landscape along the river is tortuously cut by deeply dissected streams, making for considerable difficulty in constructing reliable water delivery systems. Most of the water delivery systems along the wild reaches of the Rogue were constructed of wooden troughs and flumes. The topography posed considerable challenge and virtually excluded long networks of earthen contour ditches that were built to access the rich diggings elsewhere in southwestern Oregon (Budy 2000). Even if the engineering problems could be overcome, there was no capital to develop major ditch networks such as those constructed in other mining districts. The construction of a one mile long flume to Tyee Bar took ten months and nearly bankrupted Mickey's small company (Mickey 1974). More importantly, there was little

expectation at the time for deep auriferous bench deposits to be found higher on the slopes so major investment was not warranted.

The only major placer producer close to the project vicinity was developed by the Red River Mining Company along the Rogue near the mouth of Mule Creek. The Red River Gold Mining Company worked the bench gravels along the northwest side of the Rogue and the west side of Mule Creek near its mouth. Water for the hydraulic operation was supplied by a flume, suspended on trestles, that took water from the main fork of Mule Creek and gave a 180 foot head. Heavy equipment was brought in by river. Placer pipe, up to 30 inches in diameter, came down river from Grants Pass, as did a five-ton mortar box floated on a special boat built in 1910. The major period of operation was between 1891 and 1910. As of 1914, only a few acres remained and the gold was very fine and difficult to recover. By 1920, the placers were expended, and much of the early mining in this area was obliterated by subsequent floods (Diller 1914: 115; Butler and Mitchell 1916: 121-123; Brooks and Ramp 1968: 189; Purdom 1977: 45-46).

The early 1900s initiated a period of "civic boosterism" in the mining industry in an attempt to attract outside capital investment; numerous promotional tracts heralded the potential wealth of unclaimed placer ground and undeveloped properties (Kramer and Hough 1999:46; Budy 2000: 44). Old placer deposits along the wild Rogue River were explored for potential development and several were reopened briefly. Tye Bar was re-opened in 1911, but no substantial production was reported. Attention was focused on low benches located within 35 feet of the river that had not been removed in the early mining era (Diller 1914).

The Horseshoe Bend Placer was owned by a group of investors from Portland who ran a hydraulic operation on 40 acres of ground on a low bench located within ten feet of the river. Water was supplied by nearly a mile of ditch and 9-inch pipe that was bridged over the river to the bar and delivered a pressure of 150 feet. Another water supply from nearby gulches delivered 100 feet of head and was used to wash the gravel into a pit, "from which with a three inch nozzle under 150 feet of pressure the gravel is raised 8 feet through an elevator to 150 feet of sluice boxes" (Diller 1914: 114). Bench gravels located 80 feet above the river had been partially washed away in 1914 and contributed to the production of the bar; however, it is not known whether the company invested in building water systems above the bench to access these higher deposits (Diller 1914: 114).

A terrace about 25 feet above the river near the mouth of Ditch Creek at Battle Bar was tested, but had not been developed as of Diller's report in 1914. A large terrace located about 40 above the river had a small placer operation in the early 1900s; it was under consideration for development by the Winkle Bar Developing Company in 1914. They proposed to take water from Ditch Creek and divert it through a few miles of ditches. The gold was very fine and would require special precautions for its recovery (Diller 1914: 115). Development would require substantial investment, and there is no indication that the terrace was ever developed.

The placers located on benches above the river bars were worked to some extent in the period between 1900 and 1916, but for the most part, the remaining gold proved to be too sparse, too fine, or simply too expensive to mine using industrial methods. By 1920, the period of civic "boosterism" sizzled out, investors looked elsewhere, and the brief enthusiastic reopening of the placers along the wild Rogue was over. "It was quicker to mine the public than to mine the ground, and the schemes that succeeded on paper only to fail at the mining claim were many and lamentable" (*Grants Pass Daily Courier*, April 3, 1935). A few solitary miners may have worked on the river bars, but little in the way of mining occurred in the 1920s. The stock market crash in 1929, which plunged the nation into the Great Depression, changed all that.

Depression Era Placer Mining, 1929-1942

The Rogue River canyon had probably its heaviest population level during the Depression years when literally thousands of men filed mining claims or panned gold for subsistence. "Many found enough color to support families on the outside, and most of them at least panned enough gold to buy beans and bacon" (Rivers 1979: 7). Solitary men prowled the streams with gold pans (Figure 14) and worked the placer gravels along the Rogue with the primitive methods of early years. Remnants of many mining camps and diggin's can be found commonly all through the canyon as a result of that period" (Rivers 1979: 7).

The Mining Law of 1872 provided for rent-free residency on Government land, and for many individuals without other options, mining provided an opportunity to have a roof over their heads and food on the table. As Kramer (1999: 65) notes "...mining activity typically rises during time of fiscal crisis as under-employed individuals, both those with actual mining experience and those without it, flock to the National Forests and other federally owned lands." Throughout the 1930s, scores of men built cabins on public land, filed claims, and searched for gold. The effect was a large increase in the numbers of people living in the Rogue River as unemployed people flocked to the abandoned gold fields to search for gold.

This resurgence of mining activity was further stimulated by the rise in the value of gold in 1933-1934 to \$35 per troy ounce, the first increase in almost 100 years (Kramer 1999: 65-66). Many of the old, abandoned mines were re-worked. The Benton and other lode mines had their highest production during the years between 1934 and 1940; however, the re-opening of intensive placer mining operations along the Rogue and elsewhere in southern Oregon accounted for more than two-thirds of the total gold production (Brooks and Ramp 1968: 202). Important placer producers were located on the Rogue River to the east of the project area near Galice and on Grave Creek. Placers on Mule Creek were worked out by 1920; and most of the gravel bars along the wild reaches of the Rogue River retained insufficient deposits to warrant major investment by the 1930s. These were the places that served as focus for the hundreds of men who hoped to scratch out a narrow living 'sniping' for gold. "Each gravel bar and spot along the river where the floods had deposited gold was occupied by snipers. Their equipment consisted of a gold pan, a sluice box, a shovel, and a one gallon bucket for dipping water" (Morey n.d.(a): 1-2). There was little attention to



Figure 14. Solitary miners resorted to the primitive technology of the early years during the Depression Era; unidentified miner from the Southern Oregon Historical Society Photo Collection.

staking claims; "if there was room on the bar for another man he was welcome." A man might average seventy-five cents to a dollar and a quarter a day. Those who could afford a pump might move a yard and two per day and nearly double that amount (Morey n.d.(a): 2). Hundreds of men worked the gravels on Montgomery and Howard creeks, and camped along the Rogue. More than 25 buildings were located on the north bank of the river at the mouth of Montgomery Creek in the 1930s-1940; these were destroyed in the 1955 flood (Purdom 1977: 28).

When the country recovered from the Depression and started preparing for entry into World War II⁸, most of these men left the canyon. A few stayed on their mining claims and made a rough living from hunting and fishing, growing gardens, and panning a little gold. This pattern continued up through the 1960s and perpetuated the typical pattern of life along the wild Rogue and its occupation by a few solitary individualists living at the subsistence level (Atwood 1978; Beckham 1978; Rivers 1979; Atwood and Grey 1996).

Gold Lode Mining

Gold lode mines, commonly called quartz mines, in the Kelsey / Whiskey vicinity were discovered in the late 1880s, mainly by tracing the placers to their lode sources. Because of the higher development costs associated with lode mining, and the general lack of roads to haul in equipment and transport ore, earliest lode mining in the area followed upon the exhaustion of the placers in the 1880s.

Some of the earliest lode mines were developed along Mule Creek, just west of the project area. John Billings is credited with the discovery of gold in 1891. Initially, attention was focused on placer gravels near the mouth of Mule Creek, but Billings traced the placer deposits to their lode source upstream. Four important lode mines were located and developed: the Paradise, Lucky Boy (later known as the Marigold and Tina H. mines), Red River Gold Mining Company claims, and the Mule Mountain Group, all are outside of the present project area. These lode deposits consist of small quartz veins containing gold as well as some copper, iron and lead localized within volcanic and intrusive rocks drained by Mule Creek and its tributaries (Butler and Mitchell 1916; Brooks and Ramp 1968).

Stamp mills and cyanide plants operated at some of these mines, but production was never large. Only slightly more than \$100,000 in gold was recovered. A two-stamp mill was set up at Blossom Bar to crush the ore from the lode mines. It was transported upriver by barge, using cable and hand winch, from Gold Beach (Brooks and Ramp 1968: 202; Purdom 1977: 44-47).

In the Galice District southwest of the project area, the Alameda mine was a famous early gold producer and subsequently developed significant copper deposits (Figure 15). The Greenback Mine on Tom East Creek was discovered in 1897 and had a long period of

⁸With the advent of World War II, all gold mines were closed by order L-208 in 1942 and many men were drafted into military service.

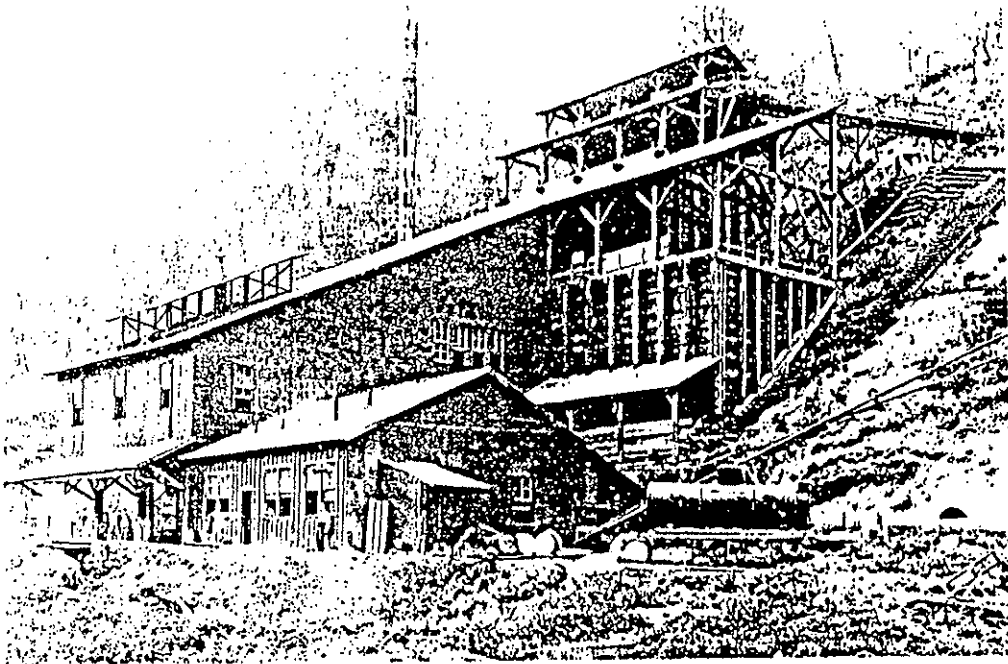


Figure 15. The Alameda Mine about 1910, from *Grants Pass Courier* in Brooks and Ramp (1968: 203).

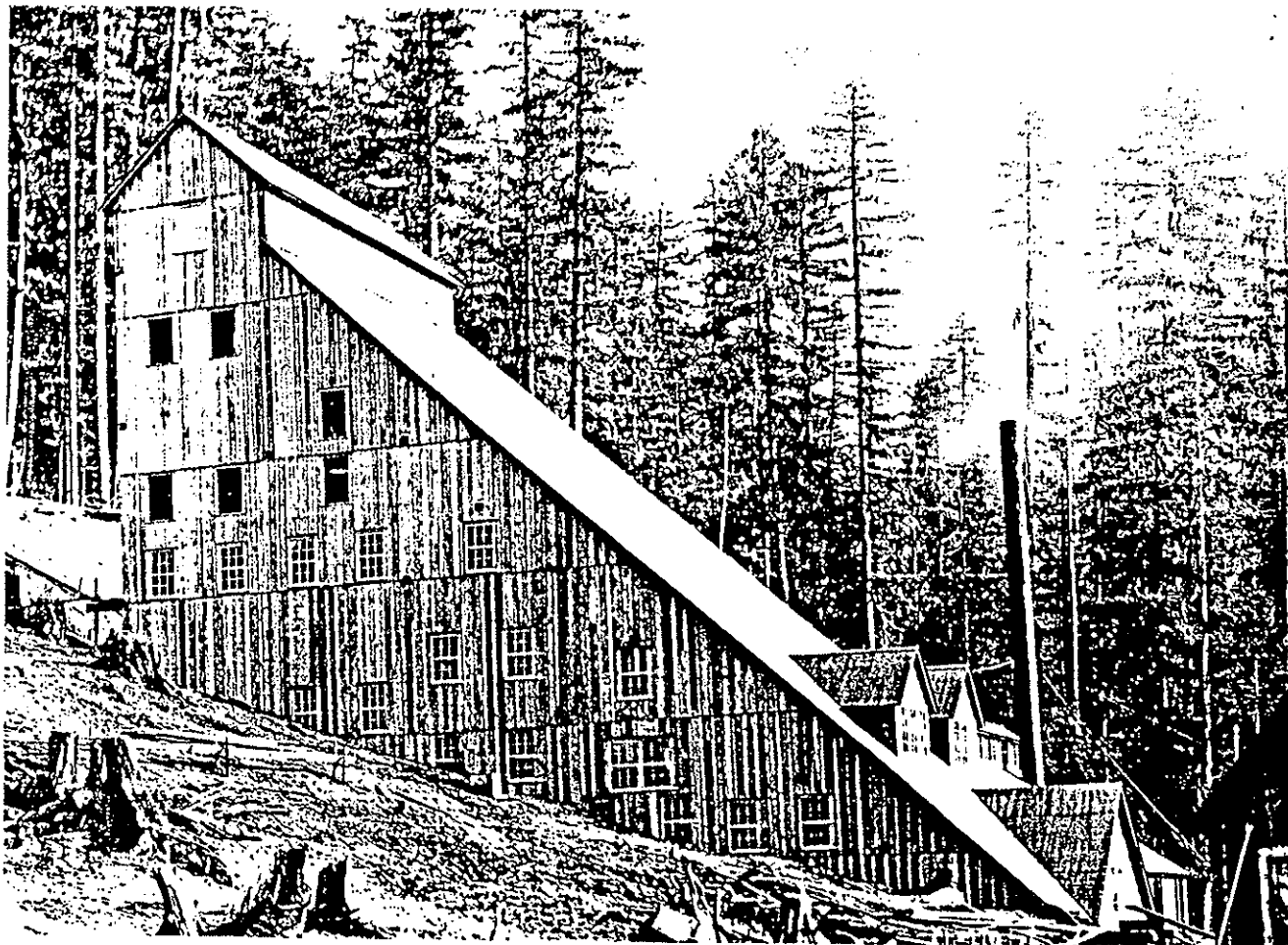


Figure 16. The Greenback Mine, from Hill (1976: 38).

operation (Figure 16). Initially, ore was processed with an arrastra, but a 40-stamp mill with concentration tables and cyanide tanks was installed in the early 1900s that could handle 100 tons of ore per day (Libbey 1963, 1967; Brooks and Ramp 1968). Lode mines in the Mt. Reuben District within the Kelsey/Whiskey Project area never attained the fame, or sustained the kind of production of those in adjacent areas, but in their brief periods of operation were some of the most important gold producers in southwest Oregon.

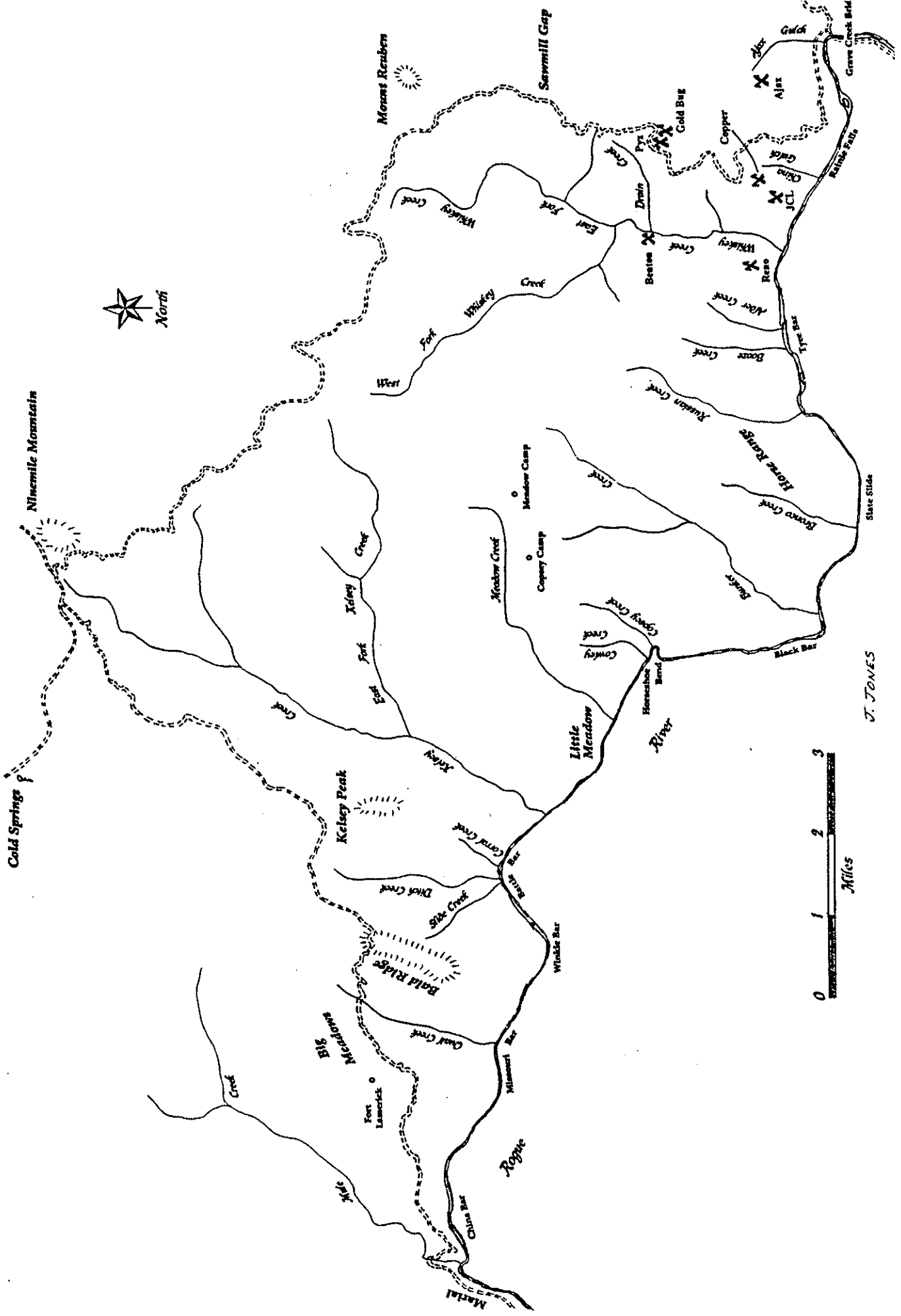
Mt. Reuben Mining District

In the eastern part of the project area, gold was mined from several lode deposits associated with the Rogue Formation in the Mt. Reuben Mining District (Brooks and Ramp 1968). Gold occurs as veins in quartz diorite and in gabbro that penetrate the altered volcanic rock of the Rogue Formation. The lode mines of the Mt. Reuben District occur along a northeast-trending belt 5 miles wide and 15 miles long; those found in the Kelsey / Whiskey Project area are found along the Mt. Reuben ridgeline and on the slopes of numerous tributaries to Whiskey Creek (Figure 17).

Early development of the lode mines occurred in the late 1880s and early 1890s and production peaked between about 1900 and 1915. From 1915 to 1933, most of the mines were closed or, at best, were just managing to keep up with their assessments. When the price of gold was raised in 1933-1934 to \$35 per troy ounce, many of the lode mines reopened. The Depression years produced the highest gold recoveries from the Rogue mines that any had reported previously, or for that matter, subsequently. In 1942, order L-208 effectively closed all gold mines, since these were not considered essential war effort. Lode mines were re-opened after World War II but produced very little. As of 1963, only a few lode mines were active and these were mainly involved in development and rehabilitation work (Ramp 1978: 39).

Several historically important quartz mines are located in the Kelsey / Whiskey Project. The earliest operating mines in the district, and the most productive in terms of gold production, were the Gold Bug and Benton mines. The Gold Bug Mine, located primarily on ridgetops near Drain Creek and Gold Bug Gulch began operation in the late 1880s. It was one of the largest producers in Oregon with a total production of about \$750,000; however, it closed sometime before 1914. In 1898, the Gold Bug Mine operated a steam-powered five-stamp mill (Diller 1914: 52-53; Youngberg 1947: 17-18; Brooks and Ramp 1968: 209).

The Benton Mine, located along Drain and Whiskey creeks, was discovered in 1893 and initially developed in 1894 by J.C. Lewis. It was shut down in 1905 but reopened when the price of gold was increased in 1934. Between 1934 and 1942, ore mined and milled totaled 64,282 tons averaging \$8.55 a ton for a gross value of \$549,414. The Benton Mine was the largest underground mine in southern Oregon and had 10,000 feet of underground tunnels (Figure 18). Mules were used to haul the ore through the main tunnel. In 1941, it had the largest individual payroll in the county. A cyanide plant was installed in 1937 and the mine operated until 1942 (Parks and Swartley 1916: 28-29; DOGAMI 1942: 26-28; Youngberg 1947: 31-35; Brooks and Ramp 1968: 201-206).



J. JONES

Figure 17. Major gold lode mines in the Mt. Reuben District.

Around 1900, several other smaller, but highly productive, mines were opened: the Reno, Ajax, California Group, Copper Stain, JCL, and Pix. These had their most productive period between 1900 and about 1915; most were re-opened during the 1930s but never attained the extent of production reached by the Benton Mine. All but the Reno and Pix mine were patented and transferred to private lands. In 1946, Youngberg visited 23 mining sites in the Mt. Reuben District; these are described on Table 1 and shown on Figure 19 (Youngberg 1947). Apart from those described above, the mines had little reported production and many were classified as prospects; most never went to patent and remain under BLM management. With the exception of some development work, none resumed production after the war. In the early 1960s, several mines, such as the Reno, were re-opened and operated on a small scale. Numerous adits, mainly prospects, have been opened across the area in recent times, but no important new discoveries have been made. Several claims are active today at the Reno, Benton, Gold Bug, Trade Dollar, Pix, and California Group mines (Craddock 2000).

MAP OF THE MT. REUBEN DISTRICT

JOSEPHINE COUNTY, OREGON

Showing Principal Claims And Veins

T. 33 S. R. 8 W.

Key to Properties

- | | |
|---------------------|------------------------|
| 1. Ajax | 11. Mt. Reuben |
| 2. Benton group | 12. Pix |
| a. Arizona | 13. Poorman (North) |
| b. Benton | 14. Poorman (South) |
| c. Carson Hill | 15. Reno |
| d. Confidence | 16. Skinner |
| e. Georgia | 17. Saint Patrick |
| f. Kansas | 18. Tibbetts Springs |
| g. Louisiana | 19. Trade Dollar |
| h. Missouri | 20. Whisky Springs |
| i. Montana | 21. Whiteneck, 1,2,3 |
| j. Nebraska | 22. Windy Gap |
| k. Ruby Hill | 23. (Unnamed prospect) |
| l. Texas | |
| m. Washington | |
| 3. California group | |
| a. California | |
| b. Oversight | |
| 4. California Gulch | |
| 5. Copper Stain | |
| 6. Gold Bug | |
| 7. J.C.L. | |
| 8. Looney | |
| 9. Molly Hill | |
| 10. Moonbeam | |

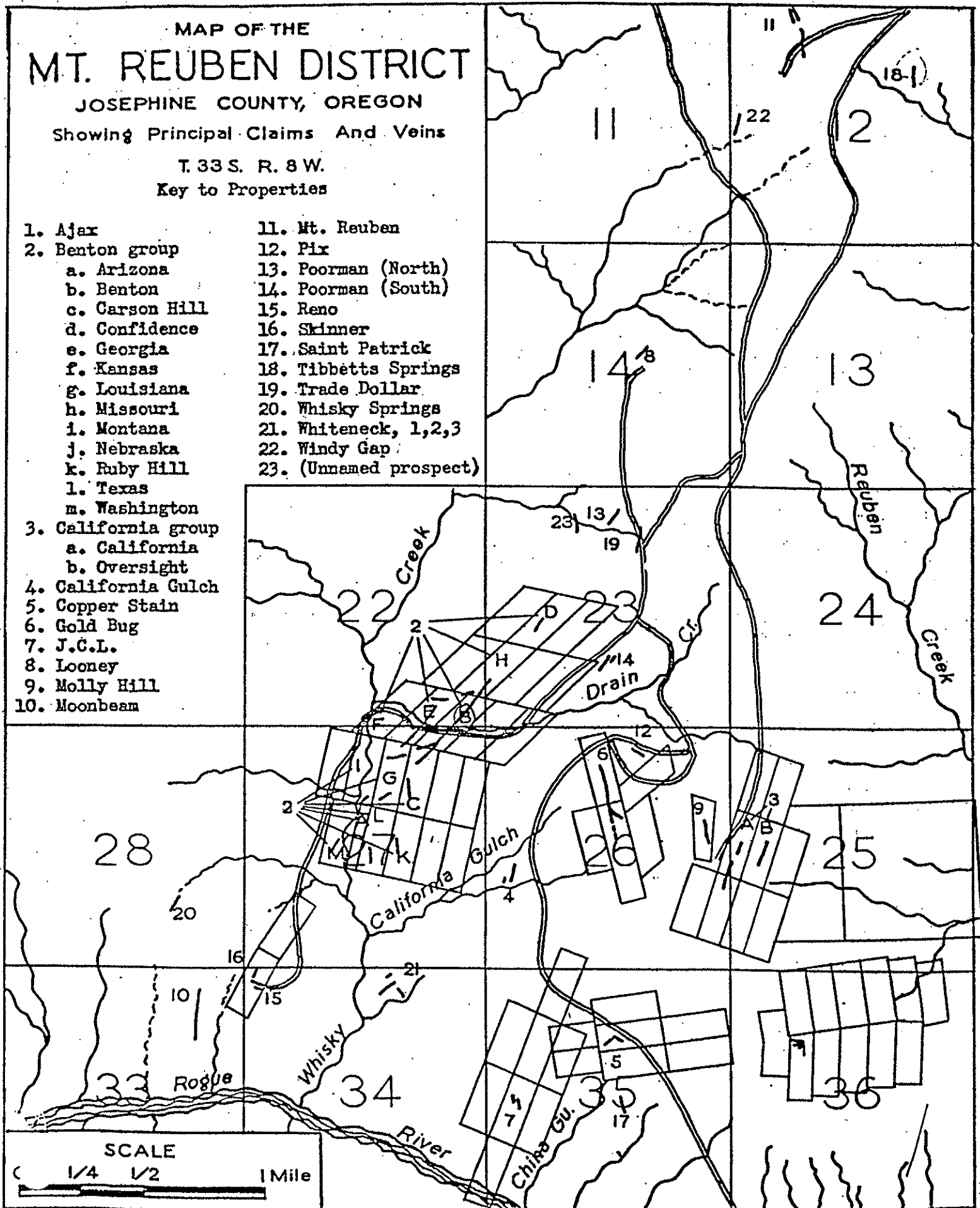


Figure 19. Map of the Mt. Reuben District showing principal mines and claims; from Youngberg (1947: 4).

Table 1. Description of the Mt. Reuben Mines and Prospects.

Name and Description	Major Periods of Operation	Status Within Project Area
<p>Ajax Mine. The mine was developed by David Williams around 1900 and produced some of the best gold rock mined in the Mt. Reuben District; however, it was inactive in 1913. The mine was operated originally with a two-stamp mill. In the 1930s, the mine was taken over by the Ajax Union Mining Company based in Grants Pass (<i>Grants Pass Daily Courier</i>, April 3, 1935; Diller 1914:53; Youngberg 1947: 4,11; DOGAMI 1942: 16; Brooks and Ramp 1968: 207).</p>	1900-1930s	Located within project area but on private property.
<p>Benton Mine. The Benton Mine was discovered in 1893 and initially developed in 1894 by J.C. Lewis. It was shut down in 1905 but reopened when the price of gold was increased in 1934. Between 1934 and 1942, ore mined and milled totaled 64,282 tons averaging \$8.55 a ton for a gross value of \$549,414.. The Benton Mine was the largest underground mine in southern Oregon and had 10,000 feet of underground tunnels. Mules were used to haul the ore through the main tunnel. In 1941, it had the largest individual payroll in the county. Equipment included mill, crusher plant, mine cars, 4500 feet of 12-lb rail, diesel-powered compressor, and jackbit furnace. A cyanide plant was installed in 1937 and the mine operated until 1942 (Parks and Swartley 1916: 28-29; DOGAMI 1942: 26-28; Youngberg 1947: 31-35; Brooks and Ramp 1968: 201-206).</p>	1893-1942	Patented mine within project area.
<p>California Gulch Prospect. Several shallow cuts expose a vein at the head of California Gulch which were explored but had no lode claims as of 1947. The prospects consist of several shallow cuts 200 feet long and a 20-foot long cut that leads to a 6-foot tunnel. Its history is unknown, but it apparently did not find commercial values (Youngberg 1947: 4,19).</p>	? - late 1940s	Currently on land administered by BLM.
<p>California Mine Group. The Old California workings were discovered in 1890 and a shaft was sunk. Total workings including shafts, raises, crosscuts, and drifts is about 8,500 feet. The Wheeler tunnel, 7364 feet long, was the longest in southwest Oregon when it was constructed between 1922-1929. The mine was idle from 1929 until 1938 when it reopened; development ceased in 1941 but some active work was initiated after 1947. Total production was estimated to have been from \$3000 to \$10,000 (DOGAMI 1942: 33-34; Youngberg 1947: 4, 29-30; Brooks and Ramp 1968: 209).</p>	1890-1941	Located adjacent to project area

Table 1. Description of the Mt. Reuben Mines and Prospects.
(Continued)

Name and Description	Major Periods of Operation	Status Within Project Area
<p>Copper Stain Mine. Copper as well as gold was produced from this mine located at the head of China Gulch. The date of discovery is unknown, but it was first worked in the early 1900s. The mine was closed down for a time sometime around 1910 and then re-opened in the early 1930s, but it only operated for a short time due to failure to find gold values. Some attempt was made to re-open the mine in the early 1940s, but with the advent of WWII, operations ceased. There was no significant production after about 1932. The original equipment included a Tremaine 2-stamp mill with a crusher, a 3 by 10 foot amalgamating plate and a cannon-ball amalgamator (Diller 1914: 52-52; DOGAMI 1942: 35-36; Youngberg 1947: 4, 11).</p>	<p>Early 1900s-1932</p>	<p>Patented mine within project area.</p>
<p>Gold Bug Mine. The mine was developed in the 1880s and was active until sometime around 1910-1912. It was one of the largest producers in Oregon with a total production of about \$750,000; however, it closed sometime before 1914. The mine included two adits, two shafts 150 and 300 feet deep, a 125-foot inclined winze, and four levels with 600 feet of workings. The original mill was an amalgamation and cyanide leaching plant; crushing was done by a primary jaw crusher and a steam-powered 5-stamp mill (fueled by cord wood). A wagon road from Glendale was built to the mine in the late 1800s or early 1900s (Diller 1914: 52-52; <i>Grants Pass Daily Courier</i>, April 3, 1935; Youngberg 1947: 4, 17-18; Brooks and Ramp 1968: 209).</p>	<p>1880s-1912</p>	<p>Patented mine within project area.</p>
<p>JCL Mine. The JCL Mine was purchased by J.C. Lewis about 1900. It was operated until around 1915. It was reopened in the 1930s. In 1938, total workings included about 3000 feet in six adits on eight patented claims. About \$100,000 was recovered by stamp milling and amalgamation (Youngberg 1947:13; DOGAMI 1942: 43; Brooks and Ramp 1968: 210-21).</p>	<p>1900-1930s</p>	<p>Patented mine within project area.</p>
<p>Looney Prospect. The workings date from the early 1900s and are named for M. Looney who developed the prospect. Workings included a crosscut 75 feet long and 100 feet of drift; Looney operated a small gasoline-driven muller-type mill. The mine was closed in 1913 and no substantial amount of gold is known to have been recovered (Diller 1914:53; Youngberg 1947:4, 22-23).</p>	<p>1900-1913</p>	<p>Currently on land administered by BLM.</p>
<p>Molly Hill Mine. The early history of the mine is not known, but it was operated until the 1920s. Two shafts, 90 feet deep, were caved in 1946 (Youngberg 1947: 19-20; DOGAMI 1942: 47).</p>	<p>? - 1920s</p>	<p>Patented mine within project area.</p>
<p>Moonbeam Prospect. The prospect consists of one adit and a cut noted by Youngberg (Youngberg 1947: 4, 19). Its development history is unknown.</p>	<p>?</p>	<p>Currently on land administered by BLM.</p>

Table 1. Description of the Mt. Reuben Mines and Prospects.

(Continued)

Name and Description	Major Periods of Operation	Status Within Project Area
Mt Reuben Mine. The mine was operated in the 1940s and consisted of 7 cuts and 4 shafts, one was 40 feet deep. In the 1940s, exploration and development was limited to assessment work (Youngberg 1947:4, 23-24). Later sources report no significant production.	1940s	Located adjacent to project area.
Pix Mine (also PYX). The mine was opened in 1909 and most of its production was completed in the late 1910s or 1920s. Total production was very small and mainly limited to gold recovered from development work. The mill at the mine used a gas-powered arrastra that discharged onto amalgamation plate and small roll crusher (Youngberg 1947: 15; DOGAMI 1942: 51).	1909-1920s	Currently on land administered by BLM.
Poorman North. About \$2000 in gold was recovered from a small ore shoot, but an extension of the shoot was not found. No other information is reported (Youngberg 1947: 4, 27).	? - 1946	Currently on land administered by BLM.
Poorman South (adit on Drain Creek). The mine consists of a number of claims from Drain Creek to Johnson Springs. An adit 225 feet long is the only feature reported, and there was no production as of 1946 (Youngberg 1947: 4, 25).	? - late 1940s	Currently on land administered by BLM.
Reno Mine (also called the Elwilda Group). The Reno Mine consists of 11 claims extending along the lower reaches of Whiskey Creek. It was probably located in the early 1900s. The mine was active in 1913, re-opened in the 1930s, and then closed in 1936; it was reopened after World War II and has been operated in a small way since 1964. The original mill was a 4-stamp Parker, which was replaced by a 15-ton mill in 1930. Equipment included a crusher, ore cars, blacksmith shop, and two bunkhouses. The mine has about 850 feet of workings in three adits. Total production was about \$5,000.00. The mine was never patented (Diller 1914: 52, Youngberg 1947:17, DOGAMI 1942: 53, Brooks and Ramp 1968: 211-212).	Early 1900s-1942	Currently on land administered by BLM.
Skinner Prospect. The workings consist of a trench and shallow pit which were caved in 1946. No other information is reported but it may be on ground belonging to Reno Mine (Youngberg 1947: 4, 20).	?	Currently on land administered by BLM.
St Patrick Mine. The mine was opened around 1900 in conjunction with the JCL Mine but did not receive attention until the 1930s when it was re-opened; in 1946, the workings were inaccessible (Youngberg 1947: 4, 14).	1900-1930s	Currently on land administered by BLM ??
Tibbetts Springs Prospect. The early history of the mine is not reported, but it was operating in 1942 and produced a few hundred dollars a day. The workings consisted of two shafts and an open cut about 150 feet apart. The ore was hauled three miles to a small hand-made mill (Youngberg 1947: 4, 24-25; DOGAMI 1942: 62).	? - 1942	Located adjacent to project area.

Table 1. Description of the Mt. Reuben Mines and Prospects.

(Continued)

Name and Description	Major Periods of Operation	Status Within Project Area
Trade Dollar Prospect. The early history of the mine is unknown, but it may first have been opened in the 1930s. A tunnel was constructed in the 1930s by E. Romig, who also operated the Gold Bug at that time, and additional trenching was completed in 1941. The mine was closed in 1942 (Youngberg 1947: 4, 27).	1930s-1942	Currently on land administered by BLM.
Unnamed Prospect. An unnamed prospect consisting of an eight-foot-long adit, located below the workings of the North Poorman Group, was investigated by Youngberg in 1946 and indicated good potential for profitable gold recovery (Youngberg 1947: 4, 25).	?	Currently on land administered by BLM.
Whiskey Springs Prospect. The workings consist of a series of old prospects strung along a sloping ridgeline. A trench and cut about 20 ft long expose the vein. Dates of exploration are unknown but likely date from the 1930s (Haller 2000; Youngberg 1947: 4, 20).	? 1930s	Currently on land administered by BLM.
Windy Gap Mine. The early history of the mine is unknown, but intermittent prospecting was conducted in the 1940s. High grade ore was reported in 1946 and mine may have been developed in subsequent years (Youngberg 1947: 4, 24).	? - Late 1940s	Currently on land administered by BLM.
Whiteneck Prospects 1,2,3. The workings consist of a series of cuts and short adits on several outcrops that were named for C. Whiteneck who was last to prospect these veins. Only low gold values were found, and there is no report of significant development after 1946 (Youngberg 1947: 4, 21).	? - Late 1940s	Currently on land administered by BLM.

Lode Mining Technology

The development of lode, or quartz mines, requires special machinery and considerable capital investment. The ore has to be extracted from surrounding rock, usually by drilling underground tunnels, milled, and then the gold extracted from the crushed ore. Two early methods were used to crush the ore: one method used an arrastra; the other employed a stamp mill. In the 1930s, these often were replaced with ball mills or rod mills. In most cases, the extraction of the gold from the ore required amalgamation with mercury or treatment with cyanide.

The discovery of lode deposits usually began by working surface pockets, and as exploration discovered veins, by projecting their extent into adjacent rock and following them with horizontal tunneling or by excavating a shaft to intercept the vein. Since the drilling operation was expensive, the location of shafts and the projections of tunnels required considerable expertise. Vertical shafts accessed the underground workings at the larger mines, such as the Benton, which had developed 10,000 feet of tunnels by the end of its operation in 1941. In most of the Mt. Reuben mines, instead of removing the ore via vertical shafts, which were expensive and required special hoisting equipment, adits (horizontal tunnels) were used instead. Building an adit generally was less expensive than digging a shaft

and adits were typically dug at a slight angle to drain the mine (Sagstetter 1998: 50). The larger operations at the Benton Mine used a combination of both. Mules were used to haul the ore through the tunnels and was moved along ore carts on a small rail line to the mill site for processing (Parks and Swartley 1916: 28-29; DOGAMI 1942: 27-28; Youngberg 1947: 31; Brooks and Ramp 1968: 204-208).

A major factor affecting the mines in the Mt. Reuben district was the lack of roads and the high cost of freighting ore. The only road into the Mt. Reuben District mines was a wagon road from Glendale that was constructed to the Gold Bug Mine sometime around 1900 and later extended to the Benton Mine. Other mines in the district relied on trails and mule trains to haul their equipment. In consequence, it was cheaper to mill the ore at the mine sites. This was especially important for those mines that produced mainly low grade ore. A simple amalgamation and concentration mill could separate the waste rock so that the owner need only ship the concentrate, about 25% of what otherwise might need shipping (Sagstetter 1998: 54). The primary mines of the Mt. Reuben District - the Benton, Gold Bug, Ajax, Reno, JCL, and California - had access to very rich pockets. Only the Benton processed much in the way of low grade ore, and all development rock high enough in value to pay development costs was sent to the mill rather than the waste dump (Libbey 1963). Yet, transport costs were a significant factor at all the mines in the area. Even the small mines had on-site mills to process the ore.

To crush the rock, early quartz miners used an arrastra (also spelled arrastre) or small stamp mill. An arrastra is a circular grinding mechanism usually powered by a water wheel or sometimes by mules or men (Figure 20). The ore was placed on a flat rock surface and another heavy stone was dragged over it to crush the rock. Both the Reno and Pix mines used gasoline-powered arrastras (DOGAMI 1942). Stamp mills consisted of pile-like drivers that repeatedly drop heavy steel bars to break up the ore (Figure 21). The size of the operation could be gauged by the number of stamps. Small two-stamp mills were used at the California and Copper Stain mines while the Reno Mine employed a 4-stamp and the Gold Bug a 5-stamp mill (DOGAMI 1942). By way of comparison, the Greenback Mine had a 40-stamp mill and mines in the Comstock Lode of Nevada had 100-stamp mills (Brooks and Ramp 1968: 220; Sagstetter 1998: 59). The Benton Mine, with its extensive operation, used a series of crushers and a ball mill having a 10,000 pound ball load (DOGAMI 1942).

After the ore was crushed, the gold would be amalgamated with mercury and the remaining residue washed across concentration tables to collect anything missed by the amalgamation plates. Another method that became popular around 1900 was the use of cyanide which could recover much more gold than earlier methods. The crushed ore was placed in vats of a weak cyanide solution to soak for a few days; the cyanide dissolved the gold; and the gold was later filtered out from the cyanide. The smaller mines, such as the Pix and JCL, used mercury amalgamation, as did the Gold Bug and Reno in early years, but the cyanide process was the common method used at the Gold Bug, Benton, and Reno mines in the 1930s (DOGAMI 1942).

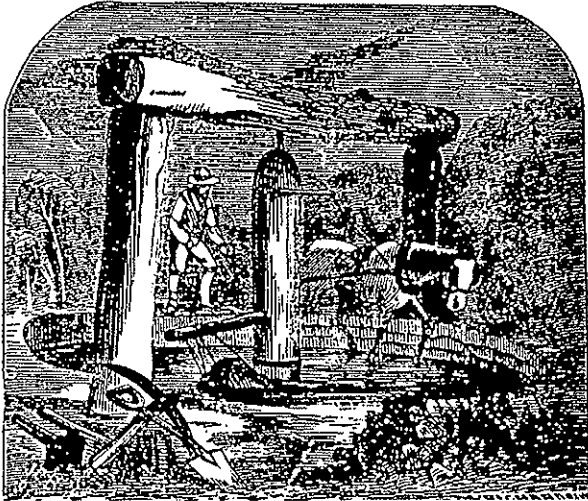
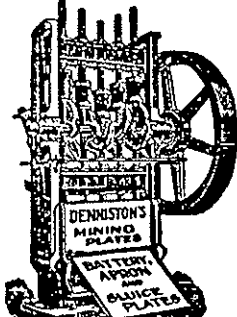


Figure 20. Two views of an arrastra, from Sagstetter (1998: 72).



**SILVER PLATED COPPER
AMALGAM PLATES**
FOR SAVING GOLD

Most extensive and successful
manufacturers. Old plates re-
plated—made equal to new.

San Francisco Plating Works
1343-51 Mission St., San Francisco.
E. C. DENNISTON, Prop.

Get our prices. Catalog sent.
Telephone Market 2515.

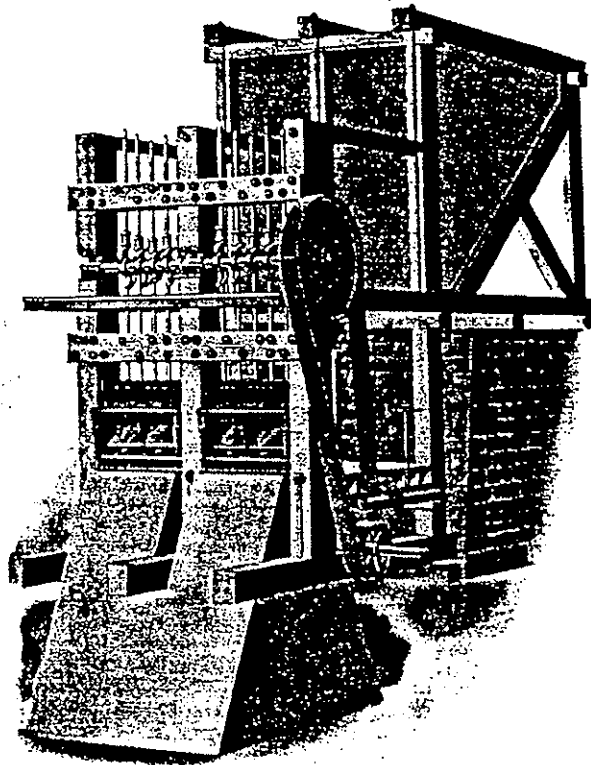


Figure 21. Two views of a small stamp mill, from Sagstetter (1998: 59, 68).